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Manchuria--Communist Keystone

O. Edmund Clubb

HALF a century ago a United States Secretary of State, John Hay, observed that, "The world's peace rests with China, and whoever understands China . . . holds the key to world politics during the next five centuries." The United States today is beginning to appreciate the significance of that forecast.

In the activation on 1 July 1957 of the United States Pacific Command, coincident with abolition of the Far Eastern Command, the shifting of responsibility for Alaskan defense, and the removal of the United Nations Command Headquarters from Tokyo to Seoul, there was an implicit recognition of the shifting of power factors in the west Pacific.

The nearly simultaneous announcements in June of the American agreement to withdraw US ground forces from Japan and of the United Nations Command's intention to start arming its troops in Korea with the latest weapons fell in the same general pattern. The focus of the power factors is Manchuria—powerhouse of east Asia. (For the purposes of this article the term "Manchuria" is used in its earlier sense, to comprise the area formerly known to the Chinese as the "three northeastern provinces" and Jehol Province. Under the Peiping regime the boundaries of the several provinces have been substantially altered, and the western part of the entire area, once described as "eastern Inner Mongolia," has been incorporated in the Inner Mongolian Autonomous Region. By present Chinese usage, the "northeastern provinces" comprise an area of only 342,000 square miles, with a population of 47 million, *exclusive* of eastern Inner Mongolia.)

Geographic Importance

Manchuria's geographic position is suggestive of its significant strategic role. It is located where China, Russia, and Japan face each other in an eternal triangle—Japan, from across the narrow bridge of Korea. Possessing vast rich agricultural lands in an area of 481,000 square miles, its population has grown from about 14 million in 1900 to upward of 50 million. At V-J Day over 40 percent of China's railway mileage, 75 percent of the electric-power capacity, 70 percent of the heavy industry, and 90 percent of China's steel production were located in Manchuria. With the best developed transport system on the Asiatic mainland, including a network of airbases, useful inland waterways, and such admirable seaports as Hulutao, Tatungkow (at the mouth of the Yalu River), Dairen, and Port Arthur, Manchuria has the communications facilities to support its role.

It is purported that the will of the Japanese Emperor Meiji, who died in 1912, proposed that Japan, having annexed Taiwan and Korea, should next undertake the conquest of Manchuria, Mongolia, and China Proper; thereupon the rest of Asia, including the South Seas,

Once again, as on previous historic occasions, a major power conflict pivots on Manchuria—a vital sector in the Pacific Ocean frontage and an eastern projection and fulcrum of Soviet power in Northeast Asia

would lie at her feet. History confirms Manchuria's key importance in east Asian politics. The decisive battles of the Sino-Japanese War of 1894-95 were fought in Manchuria, as were the land engagements of the Russo-Japanese War of 1904-05. It was the Japanese invasion of Manchuria that led to the Sino-Japanese War of 1937-45 and—almost as inexorably—to Pearl Harbor. When the Soviet Union entered the war against Japan in August 1945 the action again took place in Manchuria.

Geography alone foreordained Soviet-American rivalry in that part of the world. Kamchatka and that part of Siberia lying east of the Lena River abut on Alaska, purchased from Russia in 1867; the Russian eastward expansion in the modern period; and the American movement westward into the west Pacific have been factors in that rivalry.

Land areas lying between neighboring spheres of influence upon occasion in the past have become the foci for great power rivalries in that region. Chinese, Japanese, American, and Russian influence converged on Korea at the end of the 19th century. At the end of the 18th century, Russia threatened Hokkaido (then Yezo) from a position in the Kurile Islands. (It was only by an agreement of 1875 that Russia withdrew from the Kuriles in exchange for Japanese withdrawal from South Sakhalin; it was by her victory in the Russo-Japanese War that Japan regained South Sakhalin.)

O. Edmund Clubb was graduated from the University of Minnesota and received his Master of Arts degree from California College in China in 1940. A World War I veteran, he served for 20 years in Asia as a United States Foreign Service officer, 18 years of which were spent in China. He was US Consul in Hanoi, Indochina, at the outbreak of World War II. Other assignments have included duty as Consul General at Vladivostok, Mukden, Changchun, and Peiping. Prior to his retirement in 1952, he was Director, Office of Chinese Affairs, US Department of State. He is the author of "Pivot of History" which appeared in the February 1957 issue of MILITARY REVIEW.

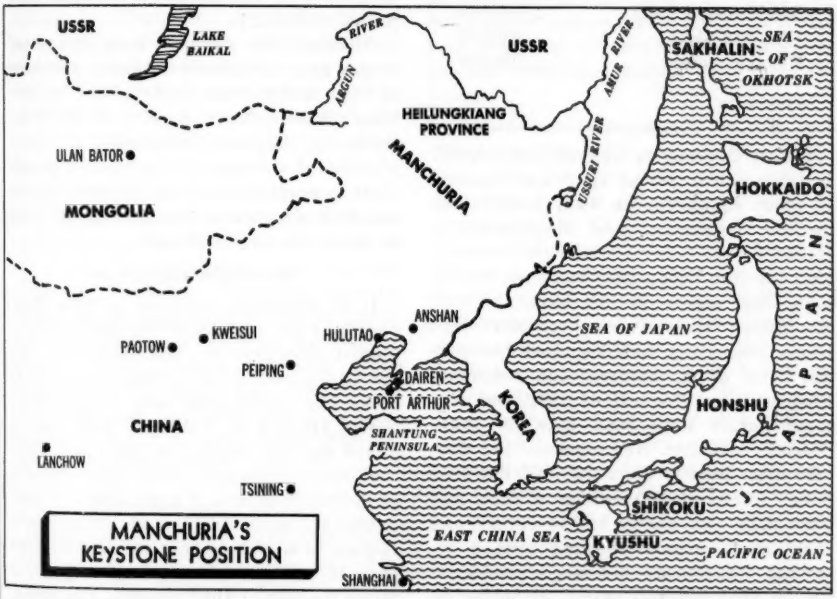
Postwar Calculations

Through the provisions of the Yalta Pact the Soviet Union on V-J Day recovered control of South Sakhalin and the Kurile chain. The Sea of Okhotsk became strategically a Soviet lake and a defensive glacis for Primorye and the rest of the Soviet Far East. The Soviet position was again advanced on Sakhalin to within stone's throw of Hokkaido, and Japan as weak as she was a hundred years before once more was caught in the middle.

Manchuria entered early into American postwar calculations. Ambassador Edwin W. Pauley, in his July 1946 "Report on Japanese Assets in Manchuria to the President of the United States," defined the pertinent US policy of the period:

> *United States policy in the postwar Far East was predicated upon the establishment of China as a strong, stable, united nation, with a basic economic self-sufficiency, so that nation could take its proper part in the development of a peaceful Asiatic economy. During the years before and after Pearl Harbor the Japanese had created in Manchuria a tremendous industrial structure which was definitely tributary to the economy of Japan. Had this structure remained as intact as it was on the date of Soviet occupancy and had China remained peaceful, the Manchurian industrial complex could have readily been integrated with China's growing economy and so greatly accelerated the over-all Chinese industrial development. . . . It was presumed that China could fill, at least partially, the economic vacuum resulting from the Japanese defeat and the consequent imposed reduction of Japan's productive capacity to a peacetime level.*

The die was cast in an unfavorable mold, from the American point of view, when the Chinese Nationalists after V-J Day adopted the heady slogan, "China will survive or perish with the northeast (Manchuria)." It was the stunning Communist defeat of the overextended Nationalist forces in Manchuria in the fall of 1948 that presaged the collapse of Nationalist power in China. Within two years the Chinese Communists had so consolidated their position that they confidently intervened in the Korean war—using Manchuria as their military base for that action.



The Communists have worked energetically to rehabilitate the Manchurian economy, and to give it the importance suggested in Pauley's report. The area promptly resumed its prewar function of providing agricultural surpluses. In the relatively lean year of 1949, Manchuria in 10 months shipped 854,000 tons of grain to China Proper; in 1950, such shipments were reported to total 2.6 million tons. The cultivation of virgin land and the development of more and bigger state farms has brought Manchurian agriculture to a stage where one province alone, Heilungkiang, was able to provide 640,000 tons of soybeans for export to the Soviet Union, Poland, and other foreign countries in 1956. Manchuria's agricultural surplus partly goes to meet shortages south of the Great Wall; but it also is used to pay for a large share of China's imports of industrial machinery, farm tractors, and railway equipment from abroad.

Industrial Potential

Manchuria is relatively rich in coal, iron ore, and other minerals, and in hydraulic-power potential. Its industrial plant measures up well to that of Japan and India —the only other Asian countries which can claim to possess a modern industry.

Major Manchurian industrial *capacity* (at which the plant had never actually operated) in 1945 was estimated by the Pauley Mission as follows:

Material	Metric Tons
Coal	25,000,000
Pig iron	2,524,000
Sponge iron	112,550
Steel ingots	1,330,000
Semifinished steel	1,000,000
Finished steel	860,000
Electric power	1,790,000 *

* kilowatts

Industrial capacity was reduced severely in the postwar period by Soviet removal of plant equipment as "war booty," and by the destruction and disorganization caused by the bitter Chinese civil war. In 1949 pig-iron production was only 172,000 tons, steel ingots 100,000 tons, and coal 11 million tons. Peiping claimed that China essentially had regained her prewar level of agricultural and industrial production by the end of 1952, but this could hardly have been true for Manchurian industry. Nevertheless, the Chinese drew heavily upon the 1950 five-year Soviet credit of 300 million dollars, and upon their own energy and resources, and early made a good showing toward restoring Manchurian industry's productivity. In 1954 pig-iron output amounted to approximately 1,500,000 tons; steel ingots 690,000 tons.

Production now is even more impressive. Peiping claims that in the year ending November 1956 the *national* production totaled 4,670,000 tons of pig iron, 4,150,000 tons of steel, and 3,230,000 tons of rolled steel, thus reaching the levels fixed for 1957 by the First Five-Year Plan (1953-57).

Although there is some steel production elsewhere in China, most of it still is concentrated in Manchuria, with the iron-steel complex centered on Anshan undergoing further expansion. Two new major iron-steel complexes, however, are being constructed at Paotow in Inner Mongolia and at Wuhan on the Yangtze River. The Chinese Communists, with Soviet aid and by building on a Japanese base, evidently have succeeded in developing Manchuria's industrial strength to a level never reached before. Even greater development is contemplated in the Second Five-Year Plan period (1958-62).

Although the Chinese have committed errors and face grave economic problems in their hasty drive toward industrialization, the indications are that, however laboriously, they are progressing toward a position of substantially increased power. This is particularly true in areas of outstanding significance for joint Sino-Soviet designs such as Manchuria.

Communist Objectives

It is, therefore, essential to view Manchuria in the context of the over-all Communist objectives in Asia. The chief target in the east Asian sector is not far to seek. The stated first aim of the Sino-Soviet alliance of February 1950 was to guard against Japan "or any other state that may collaborate with Japan directly or indirectly in acts of aggression." Japan, having the same strategic importance with respect to east Asia that the British Isles have in relation to western Europe, is a prime concern of that alliance. The American giant, inheritor of the seapower exercised *seriatim* by the British and Japanese fleets along the China Coast, is the more distant adversary—but is viewed patently as the ultimate "Enemy Number 1." This situation explains the high tensions characterizing the deadlock along the 38th Parallel in Korea.

Are the trends in northeast Asia to the advantage or disadvantage of the United States? The Peiping-Moscow axis balances politically, in a fashion, at the two ends of the slender Trans-Siberian Railway.

War waged in east Asia by the Communist allies would not now, however, be dependent upon the long rail haul from Europe as was the case with Russia in the Russo-Japanese War. The area from the Urals to Lake Baikal has taken on the character of a new major economic base, far to the east of European Russia, closer to the theoretical field of combat. Furthermore, China's industrial potential, oriented at the beginning of the century toward the China Sea and vulnerable to pressure from a seapower that might crush it against the nearly trackless spaces of central Asia, is no longer in that position reaching as it does now to tap both the economic and military power of Manchuria.

Under these conditions, Manchuria functions as the fulcrum of Communist power in northeast Asia. It is a vital sector in the Pacific Ocean frontage that stretches from the Chukotsk Peninsula opposite Alaska to the Shantung Peninsula guarding its southern approaches. Manchuria's strength helps sustain not only China Proper, but the Soviet Far East. In the framework of the Sino-Soviet alliance Manchuria is, in a sense, the eastern projection of Soviet power.

Transportation Facilities

Manchuria, in turn, is supported by the adjoining parts of east Asia—by China Proper, by the Mongolian People's Republic that has recently made its debut into international politics as a full-fledged member of the Communist bloc, and by Soviet Siberia. The communications system tying Manchuria into that geographical fabric is being developed rapidly. China's rudimentary highway system has been extended from Manchuria to the Indochina border. Tracklaying on a new railway connecting Paotow and Lanchow, the growing industrial railway hub to the south, began in May 1956. Inland railway construction removed from the exposed coastline is progressing south of the Lunghai-Lanchow line.

The opening of the Ulan Bator-Tsining Railway to traffic in January 1956 gave China more direct and better-protected access to Soviet Asia's reservoir of power. A motor-truck system for freight transport between the USSR, the Mongolian People's Republic, and China was organized as early as March 1952. Construction is scheduled to start this year on an 880-mile trunk highway running from Kukuhot (Kweisui) in Inner Mongolia to Hailar on the Trans-Manchurian railway to the north.

The Soviets energetically exploit both the Arctic Sea route and Siberian waterways for transport of freight between European Russia and northeast Asia. In Manchuria the Chinese make full use of the Amur River and its branches for cargo shipment. In August 1956 Peiping and Moscow signed an agreement for the joint development of the navigational and hydraulic-power potentials of the Amur River basin, including those tributaries which form a part of the Manchurian-Siberian boundaries—the Argun and Ussuri Rivers. The new transport lines effectively supplement, for strategic purposes, the existing network. The Communist axis is developing its command of the interior lines of communication in the continent it controls.

Military Significance

Political Asia is now much changed, 45 years after the Emperor Meiji's death, but one salient feature he would seize upon at a glance: the cataclysmic reversal of fortunes has left Japan and the lost segments of her empire, Taiwan and Korea, broadly exposed to the power of a coordinated political complex comprising China, the Mongolian People's Republic, and Soviet Asia. Manchuria, instead of constituting the Japanese Empire's mainland base, supports the Communist posi-

tion in Korea—pointing "like a dagger at Japan's heart."

The military significance of the situation is not to be ignored. It is, nevertheless, also not to be disregarded that the Communist strategists—and particularly the Chinese Communist leaders—are men of many devices, devoted to the employment of strategic alternatives. An ancient strategist who has reputedly deeply influenced Mao Tse-tung's military thinking is Sun Tzu who wrote toward the end of the fifth century B. C. on *The Art of War*. In the spirit of his dictum that "all warfare is deception," Sun Tzu's doctrine is the very essence of the strategy of "the indirect approach." "That general is skillful in attack," he held, "whose opponent does not know what to defend; and he is skillful in defense whose opponent does not know what to attack."

Mao Tse-tung, in analyzing the nature of China's war against Japan in a lecture series "On Protracted War" delivered in 1938, faithfully adhered to the spirit of Sun Tzu's teaching. The pattern of the strategy expounded on that occasion was followed closely in the post-1945 *civil* war. It is reasonable to assume that Mao Tse-tung still holds fast to his ideas regarding the over-all strategy for overcoming an enemy who in the beginning might deploy superior forces against China.

War of Attrition

Study of the theses "On Protracted War" leads to the realization that the United States in China's eyes now occupies a political and strategic position which in some aspects resembles that of Japan at the beginning of the 1930's. It may be deduced as probable, therefore, that Peiping views China's contest with the United States as being a protracted war of attrition which has reached the stage of strategic stalemate, when war weariness might be expected to assail the enemy and China's guerrilla actions could be supplemented by mobile warfare.

The present conflict is, of course, not characterized by open battles between opposing military forces on the soil of one or the other antagonist. In 1938 Mao Tse-tung looked ahead to the worsening of Japan's international position, with the possibility of a new war being touched off in southeast Asia or Siberia, and a resultant bogging down of the enemy's divisions. He anticipated no quick victory then; for "it is vain . . . to wish to wage strategically decisive battles to hasten toward the path of liberation before definite changes in the relative strength of the warring parties have taken place." It is manifest, from Communist actions and maneuvers, that Peiping expects and seeks no quick decision in the struggle with the United States now. The immediate concern still is with Japan and Manchuria's importance in that situation is plain.

Since the 1955 Bandung Conference and the 20th Communist Party Congress at Moscow in 1956, Peiping and Moscow evidently have viewed the instruments of "peaceful coexistence" and "economic cooperation" as offering a more promising means of winning the contest than the sword. Again the key to Communist strategy may be found in Sun Tzu: "To fight and conquer in all your battles is not supreme excellence; supreme excellence consists in breaking the enemy's resistance without fighting."

United States—Japanese Relations

Peiping and Moscow thus strive to neutralize US influence in Japan. Japan for her part currently accepts American protection and aid—but this is not a close political association of equals. The inherent instability of that relationship is suggested by the history of US-Japanese relations since both became naval powers in the Pacific. The United States supported Japan in the Russo-Japanese War only to see the two states later join forces against American efforts to penetrate

their Manchurian spheres of influence. In the Siberian intervention of 1918-20, the United States defended Russia's territorial integrity against Japan. Conversely, by the policy of Secretary of State Stimson in the 1930's, Japan was viewed as a buffer against the Soviet Union. The United States in the 1930's completely rejected the Japanese thesis that the danger of "the Bolshevization of China" warranted the Japanese military occupation of Manchuria. The uncompromising American support of China against Japan led to the Pacific war—and the destruction of Japanese military power.

In the past, as is evident, Asian factors molded American-Japanese relations; so will it be in the future—for Japan is irrevocably of Asia. Japan patently does not have the same relation to the United States today as she occupied with Great Britain in the Anglo-Japanese alliance of 1902. The situation is more nearly like that of Germany in 1922 when the German-Soviet Pact of Rapallo was signed. Japan regained freedom of international maneuver by her *rapprochement* with Moscow and entry into the United Nations at the end of 1956. She now is able to pursue her national interest more single-mindedly.

The United States does not lack factors of strength in her relations with Japan, but that relationship also is not without certain obvious shortcomings. The Sino-Soviet axis logically can be expected to take full advantage of such weaknesses, and to exploit its own potential to the utmost. Their objective is to develop close political and economic ties with their Asian neighbor, with the ultimate aim of causing Japan to align herself with "neutralist" or overtly anti-American groupings.

The factors in the equation are many. Japan's foreign policy is affected by domestic politics as well as by international developments. Questions of irredenta like the southern Kuriles—or Okinawa—sometimes will be temporarily shelved in consideration of more urgent matters. Issues of national livelihood, however, are exigent and not long to be denied. Among such issues are the fishing rights in the Okhotsk Sea and the waters of Kamchatka and, more importantly, the relations with China.

China presents to Japan both a potential military threat that cannot be ignored and the promise of economic benefit. From Manchuria, so long within the Japanese sphere of influence, Japan formerly obtained coal, steel, wheat, and soybeans in quantity; she still could profitably import some of her needed raw materials from there. Peiping now holds out the lure of increased trade once more, and Japanese commercial interests are bent on exploring the possibilities in that regard.

Conclusion

Communist leader Nikita S. Khrushchev tendered the Party Congress of February 1956 a political estimate:

> *The new period in world history, predicted by Lenin, when the peoples of the east play an active part in deciding the destinies of the whole world and have become a new and mighty factor in international relations, has arrived. . . . International relations have spread beyond the bounds of relations among countries inhabited chiefly by peoples of the white race and are beginning to become genuinely worldwide relations.*

Mao Tse-tung and the other Chinese Communist leaders almost certainly accept that estimate. The indications are that the Sino-Soviet allies are acting on the basis of some such appraisal of the world situation. In the vital sector of northeast Asia their strategic design is being unfolded. Once more, as on a number of previous historic occasions, a major power conflict pivots on Manchuria.

KEEPING PACE WITH THE FUTURE--

Development of Doctrine at USA CGSC

Colonel Victor W. Hobson, Jr., *Infantry*, and
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I find that analogies to previous periods in the evolution of warfare lull rather than alert the literal-minded members of our profession. In point of time there is no parallel between the cataclysmic change effected by nuclear fission and the change effected by technological developments of the past such as the invention of gunpowder.

—General Willard G. Wyman
Commanding General, US CONARC

This is the fourth in a series of articles expanding various aspects of "USA Command and General Staff College Keeps Pace With the Future," written by Major General Lionel C. McGarr, USA, Commandant of the College, and published in the April 1957 issue of the MILITARY REVIEW. *—Editor.*

CURRENT DOCTRINE

IN THE past, the development of US Army doctrine has been based largely upon the application of historical experience to moderately changed battlefield conditions. Although historical experience remains important in the present situation, three major factors have exerted a powerful impact upon the doctrinal effort throughout the Army. These factors are technology, the vital role of the Army as an instrument of national policy, and the requirement that doctrine be based more on theory than in the past.

Technology

In this era of dynamic technology, the science of weaponry has advanced at a rate exceeding all previous experience when contrasted with the gradual developments of the past. Many of our most powerful weapons have grown to maturity within a brief span of years. This ever-increasing tempo of technological advance has in turn forced a corresponding acceleration in the formulation of doctrine. At the outset, the doctrinal effort must be employed in closest coordination with the development of new weapons to ensure that new tools provide a complete weapons system compatible with tactical operations. As the development of a new weapons system progresses, the need for prompt and effective integration into US Army organizations rapidly emerges. To meet this requirement effectively, doctrine should be distributed to Army field forces prior to the actual availability of new weapons. The doctrinal effort must then forge ahead, anticipate the capabilities of new weapons

The USA CGSC, the senior tactical school of the Army, is ever conscious of its responsibilities for the development of doctrine to keep pace with the science of weaponry in this era of dynamic technology

systems, and provide for prompt operational exploitation of these capabilities. Hence we must develop the doctrine as we await the better weapons—guided by the premise that this doctrine will mold the Army of the future and yet must not, at the same time, compromise the ability of the Army to fight today.

Role of the Army

Doctrine suitable for a modern army must effectively support the most modern concepts of the mission of the Army as an instrument of national policy. It must incorporate the wide variety of possible roles and operational environments in which the Army must be prepared to operate. The roles of the Army are based on national requirements and policies, the current world situation, and logical developments which may evolve therefrom. They are related to the types of war (general or local) or situations short of war in which Army elements may become engaged. Operational environments of Army field forces are determined by their roles and other variable factors such as the scale of the use of atomic weapons, the geographic locale, the friendly force structure, and the nature of the enemy.

Doctrine Based More on Theory

Combat experiences of World War II have served well as a foundation for US Army doctrine applicable to a specific environment. However, the battlefield of the future must be viewed in the light of an environment which is completely new, novel, and different. Historical experience in the employment of the vastly increased combat potential available to modern armies is lacking. Certain practical limitations have, in addition, prevented thoroughly realistic and conclusive field testing of a new and powerful arsenal of weapons. As a result, modern doctrine of necessity must be based more on evaluated theory (supported by thorough field test) than in the recent past.

USA CGSC Doctrinal Mission

USA CGSC has a deep sense of responsibility for the doctrine it recommends. Although the Army is in a great state of change to adjust to the atomic-technological era which is crucial to the Army's future, USA CGSC is continuing the traditional sound policies in relation to doctrine.

However, the impact of the three factors discussed above has greatly increased the complexity of the USA CGSC doctrinal mission and has generated an urgent tempo of search for solutions. The scope of this important mission encompasses tactical and logistical doctrine pertaining to the employment and operations of the division, corps, and field army, including their logis-

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Colonel Victor W. Hobson, Jr., was graduated from the United States Military Academy in 1940 and served with the 88th Infantry Division in the Italian Campaign during World War II. He was assigned as tactical officer at USMA from 1947 to 1951. He graduated from the U. S. Army Command and General Staff College in 1952, and subsequently served with the Assistant Chief of Staff G2, Headquarters US Forces in Austria, and with the 350th Infantry of the same command. After his graduation from the U. S. Army War College in 1956, he was assigned to the faculty at USA CGSC, where he is Assistant to the Assistant Commandant for Doctrine.

Colonel Oliver G. Kinney attended the University of California where he received his A. B. degree in 1936. He also is a gradute of the U. S. Army Command and General Staff College (1950) and the Armed Forces Staff College (1954). He served with the 30th Infantry, 3d Infantry Division, during World War II. Other assignments include staff duty at Headquarters, Army Ground Forces; as PMST; duty with the 19th Infantry, 24th Infantry Division, in Korea; and a tour of duty with the US Army in Europe. In August 1957 he was assigned to the faculty of USA CGSC, where he is Assistant to the Assistant Commandant for Combat Developments.

tic systems, the communications zone and its subordinate elements, and the theater army personnel replacement system. This responsibility includes for the above command levels, joint and unilateral army operations, airborne and amphibious operations, and operations involving logistic support by Army transport aviation. Within this scope, the doctrinal mission of the College is:

Initiate action as necessary to formulate or revise doctrine, including joint doctrine, within the concept guidance furnished by the Commanding General, U. S. Continental Army Command.

Develop doctrine, including doctrine for joint operations as directed by the Commanding General, US CONARC.

Review, evaluate, and coordinate, as directed by the Commanding General, US CONARC, doctrine developed by other services and other Army agencies, including doctrine for joint operations.

The foregoing doctrinal mission of the College consists of two parts—current doctrine (including training literature) and future doctrine (combat developments). Current doctrine includes doctrine from the present and projected forward about three years. Future doctrine projects further forward into five- and 10-year time spans. Obviously, it is impossible to draw a clear-cut line between the two. Hence a borderline or "gray area" develops in the transition from current to future doctrine which dictates close coordination between responsible agencies in each area.

Implicit within the College doctrinal mission are three major responsibilities:

First, the College prepares selected officers of all components of the Army for future duty as commanders and general staff officers. The College must, therefore, ensure student understanding of the most advanced doctrine and of the experience and theory from which it was developed.

Second, training literature prepared by the College must reflect completely modern doctrine which properly integrates new developments and recognizes the varied conditions under which the US Army must be prepared to operate.

Third, the broad scope of the assigned doctrinal mission (division, corps, field army, and communications zone and its subordinate elements) requires that the College take the lead, under direction of US CONARC, in the development of doctrine suitable for modern Army organizations in the atomic age.

Organization for the Development of Doctrine

The readjustment of the College organization initiated on 4 December 1956 facilitated accomplishment of the College doctrinal mission and associated responsibilities outlined previously (See Figure 1; College Organization for Doctrine). Within the College, the revision or development of current doctrine is now assigned to functionally organized resident instruction departments. These departments are charged with responsibility for both doctrine and instruction within clear-cut areas of responsibility as indicated by their titles—made possible by their functional organization. Development of future doctrine, discussed in the second part of this article, is assigned to the Department of Combat Developments (Figure 1).

The College current doctrinal mission is reflected organizationally on the staff by an Assistant to the Assistant Commandant for Current Doctrine (AAC/DOC). Staff responsibility for future doctrine is assigned to an Assistant to the Assistant Commandant for Combat Developments who is also Chief of the Department of Combat Developments (AAC/CD).

New or revised doctrine, both current and future, is reviewed by the Faculty Board and approved by the Commandant

prior to use within the College or submission to higher headquarters for approval, thereby ensuring the application of the most mature and considered judgment to each major issue.

The above organization and procedures provide essential coequality to the two basic College missions—instruction and doctrine. Increased stature accorded the doctrinal effort by establishing it as a separate, interdependent entity has served to dispel the philosophy that current doctrine is solely a byproduct of instruction. Decentralization of authority and responsibility to resident instructional departments in the development of doctrine has given impetus to the doctrinal effort, fostered initiative, and stimulated the search for new ideas, at the same time ensuring College level control of essential matters.

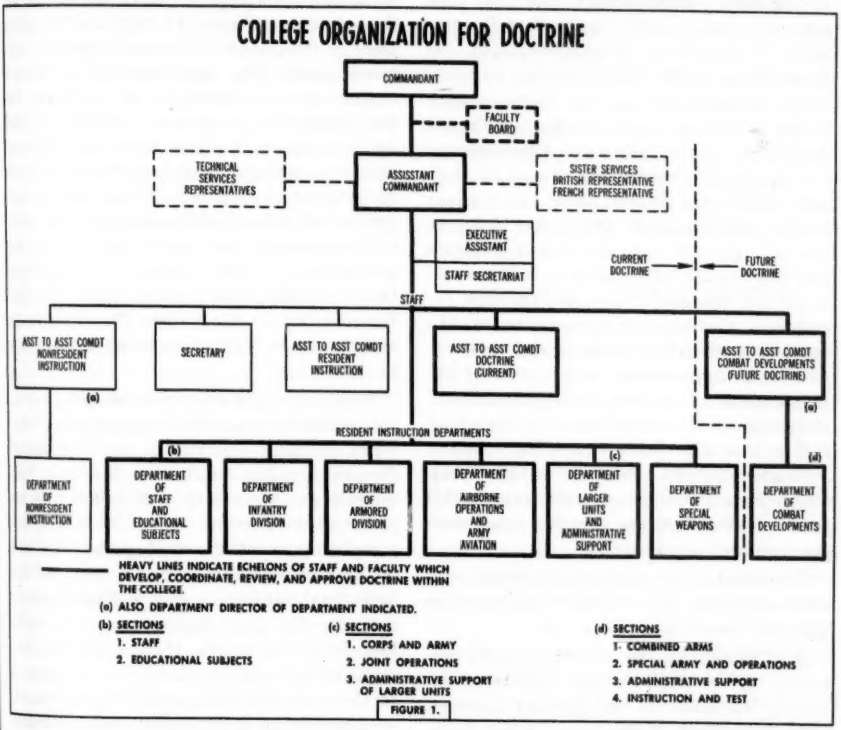


FIGURE 1.

Functions of the Assistant to the Assistant Commandant for Current Doctrine

As one of the five principal College staff officers, the responsibilities of the Assistant to the Assistant Commandant for Current Doctrine include the following:

Coordination of the resident instruction departments in their development and revision of current doctrine and training literature. In view of limited College resources, the dimensions of the over-all USA CGSC task for current doctrine have been greatly magnified by changes during the recent past which have rendered obso-

lescent a large part of doctrine for which USA CGSC is responsible. Further, changes in Army organizational structures have necessarily resulted in successive cycles of revision and review of current doctrine and training literature. The training literature task alone encompasses preparation responsibility for 23 field manuals; five training texts; two Department of the Army pamphlets; and one Department of the Army training circular.

Coordination of current doctrine with future doctrine in conjunction with the Assistant to the Assistant Commandant for Combat Developments. Through close and continuous liaison with the College combat developments effort, the integration into current doctrine of new concepts and the results of tests of new organizations and equipment is expedited and facilitated. Doctrinal requirements of the resident instruction departments are reflected, as appropriate, in projects of the Department of Combat Developments and the assignment of doctrinal projects which fall within the borderline area between current and future doctrine is facilitated. The separate College agencies responsible for current and future doctrine are, therefore, mutually supporting.

Coordination of College developed current doctrine with higher headquarters and other service schools.

Staff supervision of the review and evaluation of current doctrine prepared by outside agencies. In the field of training literature, Army Regulations 310-3, Military Publications, Preparation and Processing, *prescribes USA CGSC review of all such material pertaining to battalion or higher level units to ensure coordination of tactical doctrine relating to the employment of combined arms. The workload involved is of considerable magnitude—during Fiscal Year 1957, 102 such publications or manuscripts were reviewed; for the first quarter of Fiscal Year 1958, 43 have been reviewed.*

Development of Doctrine by the Resident Instruction Departments

The foregoing discussion of staff responsibilities for control and coordination of current doctrine provides essential background for an understanding of the doctrinal processes within the resident instruction departments. It is within these departments (Figure 1) that current doctrine is developed within well-defined doctrinal areas. The department is provided College concept guidance or may, on its own initiative, develop or revise doctrine for subsequent College approval. During the preparation of doctrinal material, each department project officer coordinates laterally with other College agencies and special representatives, as required. Further processing includes department review, College staffing, and review by the Faculty Board prior to use within the College or submission to higher headquarters for approval.

Because of the dual mission assigned to the resident instruction department (instruction and doctrine), the individual faculty member (author-instructor) frequently performs both a doctrinal and instructional function. His role in the accomplishment of the College mission for current doctrine is similar to that of the individual soldier in any military operation. In the final analysis, success rests largely in his hands. He ensures the validity of current doctrine by submitting it to thorough, detailed, and critical consideration in the preparation and presentation of instruction.

Further, the design of the 1957-58 USA CGSC curriculum provides a classroom atmosphere which encourages open, free, objective, intelligent, and constructively critical discussion of current doctrine. Emphasis is placed upon developing student ability to study, analyze, and critique current doctrine. In other words, the author-instructor is directed toward an energetic, searching effort to improve doctrine.

Immediate Problems—Current Doctrine

The improved organization and operating procedures described above—coupled with continuous analysis of the adequacy of doctrine—foster, encourage, and seek the development of new and improved doctrine utilizing all possible sources. Among the priority projects upon which College effort is focused are the development of the truest possible perspective of the atomic battlefield, the modernization of the logistics system of the Army in the field, and a continuing reexamination of the adequacy of the tactical staff system. The atomic battlefield picture provides the framework for the entire doctrinal effort. The operational effectiveness of the Army of the future rests heavily upon the logistics system which provides its support. Logistic organizations and procedures must, therefore, be thoroughly oriented toward satisfaction of the requirements of the combat forces and must attain a degree of mobility, flexibility, and responsiveness compatible with operations on the atomic battlefield. It would appear that the foregoing objectives are most directly related to improvement in logistic organization. In order to obtain forward-looking results for future warfare the staff system should provide a clear line of responsibility for logistics, effective rear area security and area damage control, adequate fire coordination procedures, and rapid and efficient fallout prediction procedures. It is apparent that staff organization of necessity will provide an essential basis for solution of many problems in the atomic battlefield.

Summary

Development of current doctrine at USA CGSC has been reoriented to meet the challenge of the atomic age. This reorientation includes:

1. Emphasis upon a more flexible attitude toward doctrine which facilitates rapid adjustment to change.

2. The development of a new and improved doctrinal organization and supporting processes and procedures.

3. The adoption of an instructional philosophy which contributes to the improvement of doctrine.

4. Provision for continuous evaluation and exploitation of promising ideas.

As the senior tactical school in the Army Educational System, the U. S. Army Command and General Staff College is ever conscious of grave responsibilities for development of doctrine to meet the needs of the US Army and every army of the free world. The never-ending search for improvement in the art of fighting moves steadily forward in step with the science of the atom.

DOCTRINE FOR THE FUTURE

We are living in the most dynamic age in the history of mankind. Technological advances tumble from our laboratories with ever-increasing rapidity. As a result, our most progressive doctrines, organizations, and matériel stand in constant danger of being outmoded almost overnight. Evidence at hand indicates that the pace will become even faster in the future. Current literature is filled with the promise of greater things to come. All-weather aircraft which require no prepared landing fields, the aerial jeep, cargo-carrying rockets, and items not yet conceived will be available to tomorrow's Army.

As Americans we are justly proud of these achievements. In characteristic fashion we hasten to adapt these advances to our institutions. Having adapted them we immediately seek means of further improvement in an attempt to repeat the process again and again. This is as it should be. This is progress.

Unfortunately, at least from the military point of view, our potential enemies are also contestants in this same technological race. They, too, are making tremendous progress—in some cases, prog-

ress in areas in which we have at times been tempted to discount their capability. Here, then, is the crux of the problem. We must continually maintain and/or improve our relative position. We cannot afford to slip behind. There is no prize for second place.

Thus the tempo of the times dictates a continual study, examination, testing, and reevaluation of our current doctrines, concepts, organizations, and equipment. More important still, it requires that we unhesitatingly amend, discard, and forget those things which commonsense tells us are becoming obsolete or obsolescent. Further, it requires that we accomplish this work as a calculated, deliberate process in which there is no room for nostalgia or for sentimental branch or service loyalties. The hard facts are simple—that which fails to pass this continued scrutiny must be discarded. To adopt any other attitude or approach is to risk disaster for our Nation.

Army CD Organization

The Army is fully aware of the fact that new weapons, their resulting new capabilities, and the discernible future missions of our Armed Forces demand a thorough, exhaustive, and continuing search for new tactical, logistical, and organizational concepts as well as for additional new equipment and matériel. This awareness automatically requires a continuing critical reevaluation of basic fundamentals in the light of new technological and conceptual developments.

In acceptance of this challenge and in order to ensure that the search for new ideas and new ways of doing the job are vigorously pursued, the Army has established a worldwide system of combat developments agencies. These agencies are making a significant contribution to our Army's ability to "keep pace with the future." They have the task of developing tomorrow's tactical, logistical, organizational, and equipment requirements today. By so doing, they encourage inventiveness on the part of our technology by providing guidance and requirements for weapons, machines, and equipment for future use.

Centralized control and coordination of the various US CONARC agencies which make up the Army's Combat Development System is the responsibility of Lieutenant General Edward T. Williams, Deputy Commanding General, US CONARC. (See Figure 2.) The objective of the system is the research, development, testing, and early integration into units in the field of new doctrine, new organization, and new matériel, and thus to assist in obtaining the greatest combat effectiveness with the least practicable cost in men, money, and matériel.

College CD Department

The USA CGSC is one of the many agencies which contribute to the Army combat development effort. Within its as-

Achievements now within the capabilities of our scientist-soldier team often read like science-fiction. Weapons and machines that would have seemed fantastic only a few years ago may soon be commonplace.

—General Willard G. Wyman
Commanding General, US CONARC

In this dynamic age the new is soon old, whether it be hardware, application of tactical principles, or organizations.

—Lieutenant General Clyde D. Eddleman
Army Deputy Chief of Staff for Military Operations

signed level of responsibility, which embraces the Army in the field, the College performs such studies as are assigned by US CONARC based on the need, Army-wide, for the development of information in specific doctrinal areas. Other projects may be generated independently by the College to anticipate the effects that scientific and technical advances will produce, to assist in guiding these advances, and to provide new concepts for operations and organization as required. With US CONARC approval, the Commandant, USA CGSC, prescribes such study projects as may be

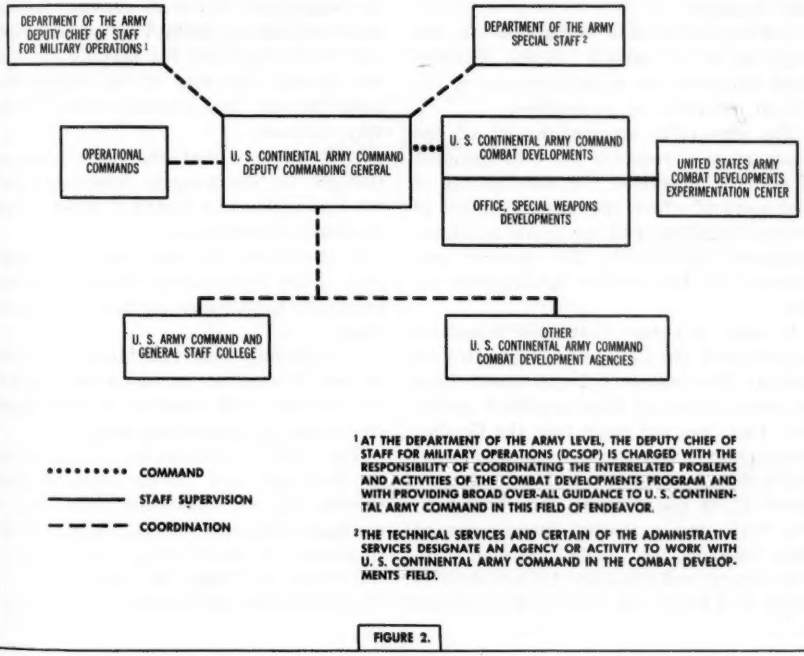

DEPARTMENT OF THE ARMY DEPUTY CHIEF OF STAFF FOR MILITARY OPERATIONS[1]
DEPARTMENT OF THE ARMY SPECIAL STAFF[2]
OPERATIONAL COMMANDS
U. S. CONTINENTAL ARMY COMMAND DEPUTY COMMANDING GENERAL
U. S. CONTINENTAL ARMY COMMAND COMBAT DEVELOPMENTS
UNITED STATES ARMY COMBAT DEVELOPMENTS EXPERIMENTATION CENTER
OFFICE, SPECIAL WEAPONS DEVELOPMENTS
U. S. ARMY COMMAND AND GENERAL STAFF COLLEGE
OTHER U. S. CONTINENTAL ARMY COMMAND COMBAT DEVELOPMENT AGENCIES
COMMAND
STAFF SUPERVISION
COORDINATION
[1] AT THE DEPARTMENT OF THE ARMY LEVEL, THE DEPUTY CHIEF OF STAFF FOR MILITARY OPERATIONS (DCSOP) IS CHARGED WITH THE RESPONSIBILITY OF COORDINATING THE INTERRELATED PROBLEMS AND ACTIVITIES OF THE COMBAT DEVELOPMENTS PROGRAM AND WITH PROVIDING BROAD OVER-ALL GUIDANCE TO U. S. CONTINENTAL ARMY COMMAND IN THIS FIELD OF ENDEAVOR.
[2] THE TECHNICAL SERVICES AND CERTAIN OF THE ADMINISTRATIVE SERVICES DESIGNATE AN AGENCY OR ACTIVITY TO WORK WITH U. S. CONTINENTAL ARMY COMMAND IN THE COMBAT DEVELOPMENTS FIELD.

FIGURE 2.

College. The College agency for execution of its combat development mission is the Combat Developments Department.

Thus by performing these projects, the College plays an active role in the Army's coordinated worldwide combat developments program.

Aside from, and in addition to, specifically assigned study projects, the College is charged, within its level of responsibility, for ensuring that new doctrine is available when needed. This requires the necessary for the execution of this responsibility.

The College Department of Combat Developments operates under the direction of the Assistant to the Assistant Commandant for Combat Developments. He is responsible for advising the Assistant Commandant on doctrinal matters pertaining to future warfare and for direct supervision of the execution of the College combat development mission. This mission includes:

1. Participation in the worldwide combat development effort as directed by US CONARC.

2. Preparation of combat development studies and related projects as directed by the Commandant, USA CGSC.

3. Orientation of the staff and faculty to ensure timely incorporation of combat development material into current doctrine and concepts.

4. Preparation and assistance in the presentation of certain combat development instruction as an integral part of the College program of instruction.

The successful accomplishment of the above mission requires the establishment of realistic objectives, the maintenance of continuity of effort, the encouragement of original thinking, and the provision of unhampered opportunity for research and analysis for the combat development effort.

In order to ensure that these essentials are obtained, the College has separated its Combat Developments Department from the main stream of other academic activities. This does not mean that the Combat Developments Department operates independently of the other academic departments. Quite the contrary, close coordination with, and a mutual interchange of ideas between, the Combat Developments Department and the other College departments is a basic and fundamental principle of College operation. Continuous coordination is effected between AAC/CD and AAC/DOC on every major project. A day-to-day working level coordination is also maintained between members of the Combat Developments Department and author-instructors of the other College departments. In addition, the College Combat Developments Department is responsible for study and review of combat development projects performed by agencies outside the College and for keeping the staff and faculty informed of the salient features thereof. This process serves a three-way purpose:

1. It ensures that the most advanced thought is continuously introduced into the instruction and doctrinal efforts of the academic departments.

2. It ensures that the ideas and experience of the instructional departments contribute to the College combat development effort.

3. It permits staff and faculty members to keep themselves current with regard to the thoughts and progress of other agencies in the developmental field.

The College procedures for executing its doctrinal and development missions provide for the maximum utilization of available resources. Study projects in the timeframe of more than three years in the future are made the responsibility of the Department of Combat Developments.

In the age of gunpowder, the profession of arms had centuries in which to evolve doctrine, tactics, techniques, and limitations to control its use. In the nuclear age, at best we have but a few years!

To achieve a dynamic response to this challenge, we urgently need your creative thought. During the next nine months you will be expected to contribute as well as to receive. The curriculum of the College has been revised just this year to give you a greater opportunity to contribute than any class has ever known before.

From your brainstorm sessions—both in and out of the classroom—we expect to receive a rich dividend in ideas. Sparks that will help us to illuminate the future.—General Willard G. Wyman, Filmed Address at Opening Exercises, USA CGSC, 1957.

Staff responsibility for these projects is carried by the Assistant to the Assistant Commandant for Combat Developments. Study projects of a more short-range nature are the responsibility of the academic departments. Projects of this nature are under the staff supervision of the Assistant to the Assistant Commandant for Doctrine.

This general rule for assignment of projects is not inflexible. Coordination between the AAC/CD and AAC/DOC may result in recommendations for the assignment of projects to the academic departments, depending on the workload and available special skills. Thus the resources of entire College departments are available to supplement those of the Department of Combat Developments.

The organization of the Department of Combat Developments is designed specifically to carry out its mission. See Figure 3. This organization was adopted after careful study by a USA CGSC Combat Developments Survey Board and was a refinement, based on two years' experience, of the organization adopted by the far-sighted action of the previous Commandant in 1955. The recommendations of this board resulted in the consolidation of the previous three separate but interdependent combat development elements into a Department of Combat Developments organized internally by function or area of interest. The merits of timeframe organization were thoroughly considered, but this type organization was not adopted because of its requirement for duplication of personnel and tendency to compartmentation of thought.

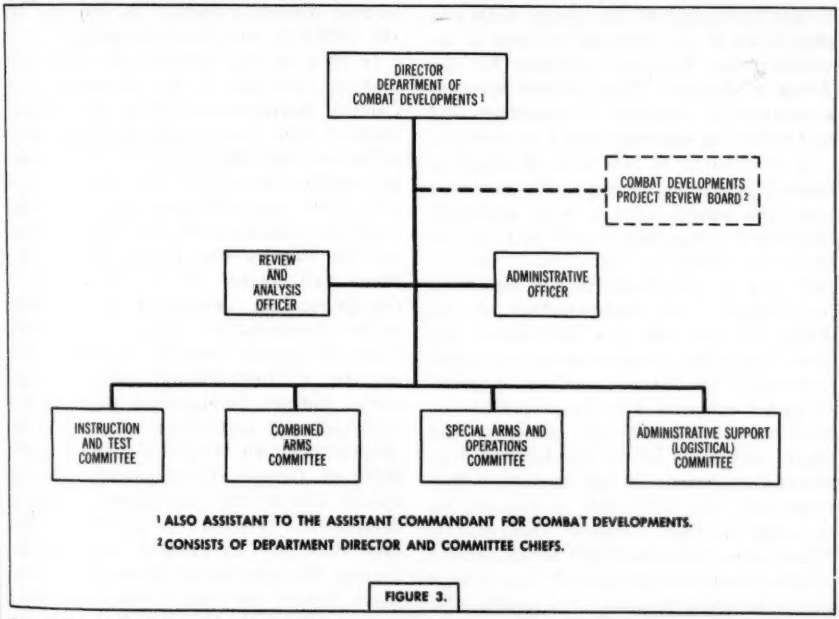

DIRECTOR DEPARTMENT OF COMBAT DEVELOPMENTS [1]
COMBAT DEVELOPMENTS PROJECT REVIEW BOARD [2]
REVIEW AND ANALYSIS OFFICER
ADMINISTRATIVE OFFICER
INSTRUCTION AND TEST COMMITTEE
COMBINED ARMS COMMITTEE
SPECIAL ARMS AND OPERATIONS COMMITTEE
ADMINISTRATIVE SUPPORT (LOGISTICAL) COMMITTEE
[1] ALSO ASSISTANT TO THE ASSISTANT COMMANDANT FOR COMBAT DEVELOPMENTS.
[2] CONSISTS OF DEPARTMENT DIRECTOR AND COMMITTEE CHIEFS.

FIGURE 3.

As indicated in the chart (Figure 3), the department is organized into three combat developments committees and a small instruction and test committee. The provision of a Logistics Committee has permitted more specific concentration on

new logistics concepts. Committee organization permits the retention of the separate identity of major functions, at the same time permitting flexible use of the available personnel resources and skills. Projects are assigned to balanced task teams, carefully selected and tailored for each project.

The Department of Combat Developments has a balanced representation of senior technical service officers in order to take advantage of the special skills and experience of the technical services in developing new logistical concepts for the Army in the field. These officers serve in a dual role as members of committees and as advisors to the department as a whole.

It is essential in this time of changing concepts that the Leavenworth graduate have the benefit of the most advanced thinking in order that he will be prepared to adjust rapidly to conditions of the future and to contribute to the continued improvement and modernization of the Army. To this end, the Instruction and Test Committee prepares certain resident instruction in future warfare subjects. Proposed concepts for future periods of time are furnished to this group by the other committees of the Combat Developments Department. In the conduct of this instruction the committee is assisted by the other College academic departments. By exposing future concepts to the critical evaluation of the student body, the College also tests these concepts in a unique and particularly effective way.

The above organization has been specifically tailored to integrate the USA CGSC combat developments effort into the Army-wide combat developments system. In addition, this adjustment has resulted in further improvement in the status of the combat developments function within the College, in improved coordination with other College organizations, and in increased efficiency of use of personnel.

In organizing the combat development resources of the College to meet the practical requirements of combat developments work, special care has been taken not to overconcentrate the attention of the department on practical or "crash" problems to the exclusion of longer range research and study, an ever-present danger in combat developments work. Balance is maintained by careful selection of projects, by keeping a balance of subjects in the long-range timeframe, and by forecasting project programs as required by US CONARC two years in advance.

In this regard, possibly the most important function of the Department of Combat Developments from the College point of view is to provide the long-range objectives and orientation of the College. By coordination between the AAC/CD and AAC/DOC, and guidance supplied by the Assistant Commandant, the Commandant, and the Faculty Board, both the instructional and combat developments side of the College are maintained on a common set of objectives. All projects, from revisions of current training literature and rewrites of instructional units to long-range combat development projects are kept mutually supporting. Because of its concentration on the future, the Department of Combat Developments plays a special role in this orientation. Figure 4 depicts this relationship of College "future doctrine" to current doctrine. As current doctrine moves forward, it overtakes future doctrine of the next timeframe and adopts this future doctrine as new, current doctrine in a continuing coordinated process.

Fields of Interest

Technological progress and continued developments in the atomic and nuclear weapons field have resulted in revolutionary changes in tactical thinking and concepts. In general, these changes emphasize the development of smaller, better balanced, harder hitting, self-contained forces capable of a much higher degree of in-

dependent action over wider and deeper areas of responsibility. Time is the essence of their activities. Instant communications, positive and authoritative command control, and speed of reaction are prerequisites in these concepts.

These new and changing tactical concepts make it mandatory that supporting logistical organizations and concepts undergo corresponding basic changes. Tactical commanders at all echelons will require increased command authority over supporting forces to ensure the necessary degree of emergency responsiveness. Maximum exploitation of combat potential can occur only with complete integration of combat, combat support, and logistical means.

These considerations, in turn, lead to a searching examination of existing command and staff relationships. The speed of reaction required on the atomic battlefield allows no time for the delays, conflicts, misunderstandings, and the coordination required under our present system. Recognized, well-defined command channels and clear-cut lines of staff responsibility must exist from the very start of any future war. The present traditional "G" staff system requires searching reexamination and possible modification and improvement to ensure its development in consonance with new organizations, weap-

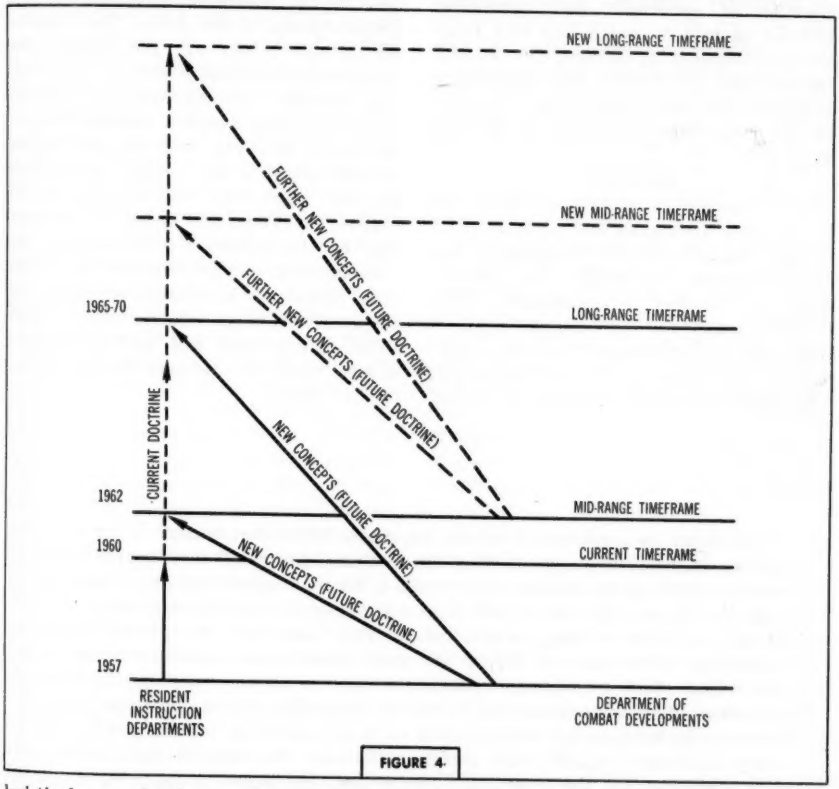


FIGURE 4

ons systems, and technological advances peculiar to the atomic age.

Many other problems and areas need consideration. Studies currently underway include matters pertaining to the following: depopulation of the battle area, the provision of "one-stop" service for supported units, combat deception, the application of automatic data processing systems to various operations and functions, airphibious operations, the tactical ramifications of fallout, and field army organizational and operational concepts for the long-range timeframe, to mention but a few.

Summary

In recognition of its responsibilities the U. S. Army Command and General Staff College has accepted the challenge of this era of dynamic technology. The Department of Combat Developments, USA CGSC's agency for the systematic, objective study of the concepts for the battlefield of the future in the mid-range and long-range timeframe, provides a means for effecting USA CGSC participation in the Army's worldwide combat development effort. The organization of the department and the integration of certain of its activities into the College instructional program provides the College a means of preparing its graduates to adjust rapidly to conditions of the future and to contribute to the continued improvement and modernization of the Army. The close interrelationship between the Combat Developments Department and the other College current doctrine agencies provides for the earliest possible incorporation of the results of future doctrinal studies into current doctrine and College instruction. Equally important, the Department of Combat Developments under the supervision of the Assistant Commandant, the Commandant, and the Faculty Board provides significant long-range objectives for the over-all College effort. In short, USA CGSC is organized and mentally attuned to meet whatever challenge the future may hold in store.

It would be a grievous error for anyone to think that because it now has atomic weapons and guided missiles, the Army can discard all of its conventional weapons and rely on atomic weapons alone. We must constantly press forward with the utmost vigor in the field of atomic weapons, missiles, and rockets, but at the same time we must not overlook the vital importance of redoubled effort toward the development of lighter and more effective conventional weapons of every kind, which are urgently needed to accomplish a great many specific tasks for which atomic weapons would be totally unsuitable. We can never afford to turn our backs upon any weapon until we have something definitely better in every important respect which performs the same function. In any situation that might develop, the Army must always have the means to apply the exact amount of force required to do the job at hand.

Secretary of the Army Wilber M. Brucker

AN AIRBORNE MAIN SUPPLY ROUTE

Lieutenant Colonel Bruce T. Falls, *Artillery*
Faculty, U. S. Army Command and General Staff College

THE capability of modern aircraft to transport men and equipment at speeds many times that of our present ground rate has been an important factor in the search for new organizations and concepts of employment. Although transportation has been an element contributing to reorganization, the principal catalyst undoubtedly has been the advent of atomics. A study of our new organizations along with proposed employment techniques points toward the use of airborne operations precepts in future war tactics and techniques. The first application of this change probably will be in the logistical support field.

Although many airborne assaults and aerial resupply operations have been conducted, there are critical problems to be solved before the complete support of large ground forces by air can be accomplished. The first major problem is based on our national defense policy of relegating the procurement of transport aircraft to a low priority. However, it should be kept in mind that from 1940 to 1945 the availability of transport aircraft had increased to the point where plans for several large-scale independent airborne operations were given serious consideration.

One such operation was the First Allied Airborne Army's plan to strike at the heart of Germany. Bearing the code name Operation *Arena*, the plan called for the use of three corps and 10 divisions, including four US airborne divisions, two British airborne divisions, and four US air-landed infantry divisions. Presented to General Eisenhower on 12 March 1945, the plan had as its objective an invasion of the Kassel—Fritzlar—Hof—Geismar area; establishment of a base from which to launch an offensive against the east face of the Ruhr; seizure of the high ground east of Paderborn; and provision of an airhead to which the Allied Southern Group of Armies could advance.

While Eisenhower, who was looking for a suitable mission for his airborne army, recognized the merit of the plan and ordered further investigation, it never got beyond the planning stage. Although sufficient troops could be provided without withdrawing some of those already in contact with the enemy, ground operations had developed so rapidly that the objective of Operation *Arena* was overrun before the details could be perfected and the means provided.

Since World War II improvement in equipment and techniques strongly indicates the probability of being able to initiate and sustain combat units by air lines of communications (ALOC). The Berlin Airlift and the delivery of supplies from Japan to combat units in Korea provided valuable experience and made use of techniques similar to those anticipated in a system of ALOC.

Feasibility tests for corps size airborne operations have been conducted through the media of maneuvers and field exercises. These exercises generally developed

Tactical, strategic, and logistical doctrine which will reflect and also keep pace with technical and scientific developments must be refined if we are to devise complete air supply procedures successfully

and tested techniques employed for the mounting and supply of an operation of this nature. Although these tests provided a solution to some problems, new difficulties appeared and some of the old problems became more acute. Airfield construction is one problem that, until very recently, has become more difficult with the years. The introduction of the vertical takeoff and landing (VTOL) aircraft, water-based, and short takeoff and landing (STOL) aircraft offers promise of a solution to this problem.

Another major problem which cannot be ignored is the impact of atomics on all phases of a future war. The possession of an ever-increasing atomic capability by other nations has emphasized the vulnerability of targets to be found in the communications zone and in the army maintenance area. The advantages of a system whereby air transportation is used for all or a substantial portion of the logistical support for forward combat units are readily apparent. It would be foolish to proclaim a fleet of transport aircraft invulnerable to enemy action. It does, however, seem reasonable to assume that an air fleet would be less vulnerable than a column of trucks, a railroad train, or the rail lines and roads themselves.

The problem of flying large numbers of aircraft from rear bases to forward areas without incurring prohibitive losses has several possible solutions. While the intervening area from the base complexes to our forward combat units will not necessarily be under our full military control, it will be relatively free from enemy installations. If, however, it should be necessary to fly over or near enemy held territory, intelligent selection of flight routes and altitudes coupled with electronic countermeasures and active suppressive fires offer means for evading enemy detection and interception. Serious consideration must be given to a system which offers promise of providing the necessary mass of supply with high-speed transport from distant and dispersed supply bases. Atomics appear to force a solution to some of the most formidable problems.

Perhaps the most valid objection to a system of ALOC is that of aircraft availability and relative cost in manpower and dollars. In the present stage of development of the aircraft and considering the existence of an established surface means, an ALOC would be considerably more costly. While cost cannot be disregarded, it must be balanced with results. Surely horse-drawn artillery was less costly than modern rocket artillery. Why change? The answer to one seems analogous to the other —to achieve victory in combat.

The pipeline-in-the-sky concept to improve the mobility of ground forces, to reduce dependence upon surface transport, and to obtain a system more responsive to the needs of the user, and yet, less likely of interruption, has many obvious advantages.

As this pipeline-in-the-sky is extended forward, problems similar to those confronted in an independent airborne operation arise; that is, availability of aircraft, aircraft vulnerability, airfield construction (or its elimination), and air movement planning and control.

Overcome these problems and it will be

Lieutenant Colonel Bruce T. Falls received his commission in June 1942; is a graduate of the Advanced Course of The Artillery School, 1951; and of the Regular Course of the U. S. Army Command and General Staff College, 1954. He served in China from February 1944 to November 1945 where he was an instructor at the Artillery Center at Kunming; Army Artillery Advisor, 46th Provincial Chinese Army; and Corps Artillery S3. During 1948-50 he was assigned as G2, 7th Infantry Division, in Korea and Japan. As a member of the 11th Airborne Division he participated in Exercise Snow Fall *in New York and Alaska, and commanded the 457th Airborne Field Artillery Battalion. He was a member of the Joint Airborne Troop Board prior to being assigned to the faculty of the USA CGSC in 1955.*

feasible to undertake independent airborne operations. When these problems are solved, the differences between normal ground operations and independent airborne operations will have narrowed considerably. The major dissimilarity will be the mode of entry into combat.

Air-Landing Facilities

In planning for operations of this nature due consideration must be given the difficult problem of determining how many airfields or air-landing facilities must be seized and developed to support the operation. First, it is necessary to differentiate between the terms "airfield" and "air-landing facility." The distinction is made between the two terms to separate the minimum essential facilities which would be provided at the forward end of an ALOC from those customarily associated with the term "airfield." This latter term connotes a complex requiring several engineer battalions to construct, and consisting of paved or surfaced runways, an operations tower, fire-fighting equipment, fuel storage facilities, and other refinements which cannot and will not be provided at the forward terminals of an ALOC. Air-landing facilities cover those minimum facilities which can reasonably be constructed to meet minimum essential requirements.

An initial air-landing facility for a *C-123*, for example, which has a relatively short ground run, might well be provided in approximately three to four hours by making use of roads or moderately compacted and level cleared fields where a pioneer construction effort can remove obstacles, improve the glide angle and runway clearance, and mark out a ground circulation plan for rapid unloading and takeoff of the aircraft.

This is, of course, only the initial construction effort. If these fields are to be used for some time, a continuing effort

Convair *R3Y-2 Tradewind*

must be provided to increase the efficiency of operations and to provide greater safety factors. An initial compacted and graded earthen runway and taxiway later may receive prefabricated matting or aluminum planking to provide an all-weather capability.

Problems in airfield construction to support a mobile operation differ from those provided to support a reasonably static force. In a static or slow-moving operation, as a protective measure against atomic attack, more air-landing facilities than the minimum required should be maintained and utilized, otherwise an inflexible air transportation system would result. Temporary loss of the use of any particular airfield or air-landing facility due to enemy action, or to the weather, would curtail the delivery of required supplies.

Constant use of limited airfields or landing facilities for prolonged periods could greatly simplify the enemy's intelligence and atomic delivery problems with a corresponding increase in danger to the supported force. However, an ALOC in support of a highly mobile force might never go beyond the initial construction effort on any of the landing facilities because of the limited time each facility would be in use. The continuous construction of new minimum facilities to keep pace with a mobile force would, in itself, provide multiple facilities and a degree of protection from enemy atomic attack.

Martin *Seamaster*

In the face of an enemy atomic capability, any operation conducted with sole dependence upon air for transportation must rely on numerous, widely dispersed, low-activity air-landing facilities. Concentration on the development and use of a relatively few high-activity airfields and air-landing facilities entails such a high degree of risk that it cannot be accepted.

In an active atomic situation it appears

that three to five air-landing facilities for each frontline division and one air facility for the corps capable of landing heavy aircraft should be provided. It should be kept in mind that air-landing supplies is not the only means of delivering supplies over an ALOC; current heavy-drop techniques permit the delivery of all but the heaviest Army equipment by parachute under almost any weather conditions.

Engineering Problems

Since engineer capabilities normally will be limited, the problem of providing multiple air-landing facilities with a limited engineer effort must be solved. There are at least four approaches to the problem, and a solution probably will require the application of all four.

1. Provision of specially tailored, equipped, and trained engineer units.
2. Improvement in aircraft landing and takeoff characteristics.
3. Lowering the existing construction criteria standards to a realistic level.
4. Skillful site selection.

Insofar as the provision of engineer units is concerned, the engineer battalion of the new airborne division is the only unit which currently possesses a capability for initiating the development of air-landing facilities. In addition, Department of the Army has given approval for the organization of airborne variable engineer units to meet this need.

Improvement in aircraft landing and takeoff characteristics are being effected by developments in production and in advanced stages of design. Among these developments are vertical takeoff and water-based aircraft previously mentioned. Water-based aircraft such as the Convair *R3Y-2* and the Martin *Seamaster* may be employed on oceans, lakes, or inland waterways of the required width and depth. Employment of aircraft of this type has several advantages. It provides a means of early and rapid buildup of air-landed reinforcements and heavy support which is not dependent on the existence or construction of air-landing facilities. Landing areas are practically invulnerable to atomic attack. Rivers or lakes within an airhead or forward area may facilitate the deployment of reinforcements and distribution of supply.

The *YC-123E*, a waterproofed version of the *C-123* equipped with a *Pantobase* landing gear, has landed on both land and water successfully. It also is designed to land on shallow swamps, sand, snow, and ice. Such a capability not only reduces airfield construction and maintenance requirements, but also affords additional passive protection from atomic attack by permitting a wide choice of landing areas.

Field exercises which have included construction of air-landing facilities indicate that the current minimum acceptable criteria, based upon emergency standards, are excessive. Included in the many factors which tend to complicate this problem is the necessity for varying the criteria with the risk that can be accepted in any particular situation. The risk that can be justified in a field exercise obviously will be relatively low. However, actual operations will require the acceptance of lower standards in runways with the attendant higher risk.

The fourth item, that of skillful site selection, requires that priority be given first to use of existing airfields without rehabilitation, then on airfields that can be rehabilitated, and, finally, on superhighways, roads, and open areas of reasonably well-compacted soil.

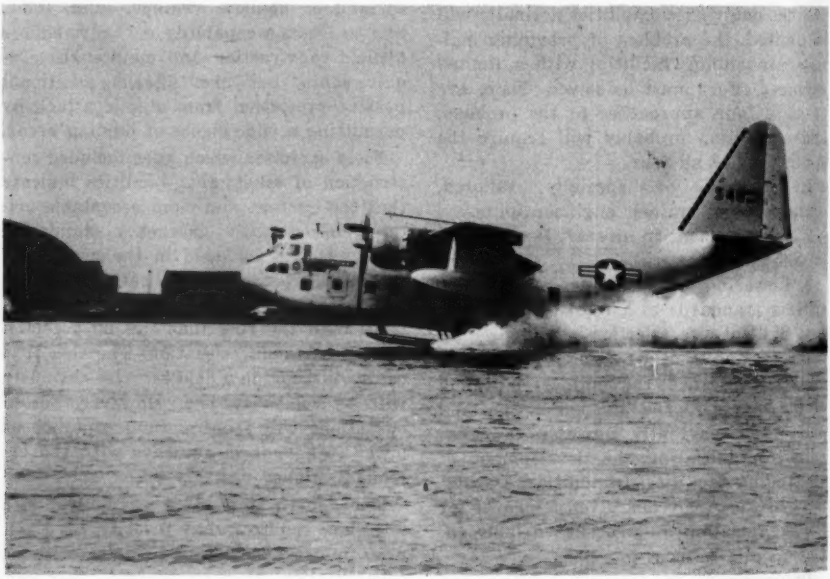
Nylon, neoprene-coated knit and woven fabrics, and vinyl-coated duck as prefabricated film to dustproof and waterproof airstrips shows considerable promise for use on low-criteria airfields. As trafficability is closely tied to the moisture content of the soil, use of the film offers a means of solving the drainage problem without resorting to costly and time-consuming conventional surfacing materials.

Concept of Operation

This ALOC concept visualizes the delivery of personnel and material from the Zone of Interior to base complexes by conventional surface means supplemented by airlift as available. From these base complexes a fleet of transport aircraft move personnel and material to support the field army in the combat zone.

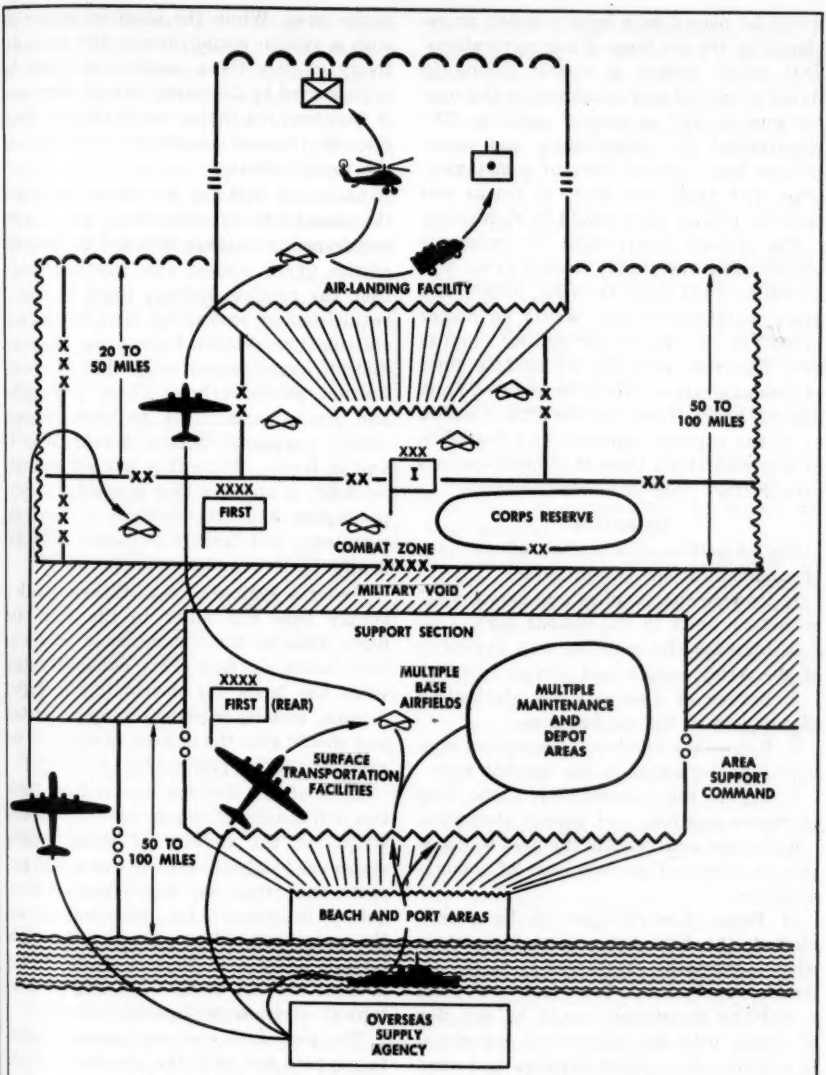
It is apparent that between the two zones there is no requirement for logistical units such as the World War II concept employed. Although the area between the base complex and the combat zone is termed a "military void," or "zone of minimum density," there may be a requirement for certain military forces to operate in and across this "void."

An analysis of an air line of communication concept employing aircraft presently developed must recognize that there are certain items which, either because of their shape or weight, cannot be currently transported by air. Included in this category are certain items of armor and heavy engineer equipment which must be delivered over surface lines of communications. One method of accomplishing this is to form armored convoys to move from the base area, through the military void, to the combat zone. These movements would be organized to provide their own security from enemy ground and/or air attack and would be resupplied by air transport while en route. Such a system also would lend itself to incorporation in the unit rotation program of armored, engineer, and self-propelled artillery units. For obvious reasons this procedure is not required or feasible in independent airborne operations, but would be applicable to a highly mobile link-up force.



Stroukoff *YC-123E Pantobase*

The ALOC system visualizes that all functions of the present advance section (AdSec), intermediate section (InterSec), and much of the army maintenance area



SCHEMATIC DIAGRAM OF AIR LINE OF COMMUNICATION

FIGURE 1.

would be moved to a base complex or replaced by the air lines of communications. This would permit a sizable saving in Army personnel and equipment in the combat zone as well as support agencies. The requirement for establishing and maintaining long surface lines of communications with their vast fleets of trucks and railroad rolling stock would be eliminated.

The present requirement for numerous maintenance and supply storage areas echeloned forward in the InterSec, AdSec, and army maintenance area would no longer exist. The time factor for moving supplies over hundreds of miles of surface lines of communications would be reduced from days to hours. There can be little question as to the superior mobility and flexibility of a system of air lines of communications over surface lines of communications.

Objectives

The objectives of a system of air lines of communications would be to:

1. Provide the supplies and services required by units in the combat zone.
2. Increase the mobility and flexibility of the Army supply and service system.
3. Reduce or eliminate the stockpiling of supplies in the combat zone.
4. Reduce the number of noncombat support type personnel in the combat zone.
5. Reduce the vulnerability of the lines of communications and supply stockpiles.
6. Reduce or eliminate the need to maintain or construct surface lines of communications.

If these objectives are to be accomplished, the field army cannot maintain what is currently considered to be the desirable supply level. The ideal level from a mobility standpoint would be one day of supply with the objective of continuing to provide all required supplies and services to the combat units and holding little or no reserve stocks forward. It will be noted from Figure 1 that supplies are delivered directly to a division air-landing facility rather than to an army maintenance area. While the ideal operation of such a system would provide for daily delivery of only those supplies required by units served by the particular air terminal, it is recognized that a small reserve stock may be required to ensure continuity of the supply effort.

Assuming that the Air Force will have the capability of delivering the supply requirements to these forward landing facilities under almost any weather condition, the problem reduces itself to one of requisitioning, packaging, distribution, and classification. Within these areas the most difficult aspect seems to be that of classification, particularly of Class V supplies and spare parts. This problem plagued supply personnel during World War II and in Korea. While it is not yet entirely resolved, it appears that a system of prepackaging and classification in the base complexes will largely overcome this difficulty.

Under a system of ALOC, even with a supply base 600 miles to the rear, the flight time to the combat zone would be four hours or less. This capability provides the basis for developing a highly flexible, mobile, logistical support system and should give the answer to many of the present supply problems.

Each of the division air-landing facilities will consist of one or more air-landing strips. In the vicinity of these landing strips are located the Air Force aerial port units and other Air Force personnel required to operate the installations and the aerial port. Also in the vicinity will be certain army and division logistical and medical support units. (See Figure 2 for typical division air-landing facility.)

The personnel and equipment required to support not only the division but certain corps and army units are air delivered into the area daily.

In the combat zone of the army there would be no army maintenance area as such. The functions formerly performed

by the maintenance area would be taken over by support brigades, base support sections, and division air-landing facilities. All fourth echelon maintenance and some third echelon maintenance would be performed in the base complex under the base support sections. This would be necessary in order to increase the mobility of the army, to reduce the noncombatant installations and personnel in the combat zone, and to provide better and faster maintenance of matériel. All depots formerly a part of the army maintenance area would be moved to the base complex for similar reasons.

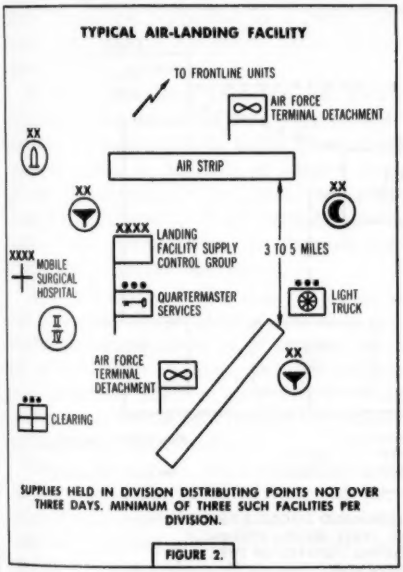


FIGURE 2.

How Does It Operate?

The cornerstone of a system of air lines of communications is the base support complex. This organization must function properly or the combat units will "wither on the vine." The base support complex will have the functions now performed by AdSec, InterSec, BaSec, and most of the current army maintenance area. In addition, all of the fourth and fifth echelon maintenance for the combat zone will be accomplished in this base area.

The duties and responsibilities of the base support will include the following as a minimum:

1. Prepare supply forecasts based on strengths and experience factors.
2. Prepare and forward to the oversea supply division requisitions for required supplies.
3. Establish and operate ports, beaches, and air-landing facilities for incoming supplies and personnel.
4. Receive and classify all incoming supplies.
5. Transship or store incoming supplies.
6. Establish and maintain required surface lines of communications within the base complex.
7. Establish and maintain airbase facilities and the attendant organization required to forward personnel and supplies to the combat units.
8. Establish and operate fourth and fifth echelon maintenance facilities for units in the combat zone.
9. Receive and process individual and unit replacements.
10. Provide base hospitalization and evacuation for all military personnel.
11. Assume area responsibility for designated zone to include military government, local defense of the area, and logistical support of all units in the area.

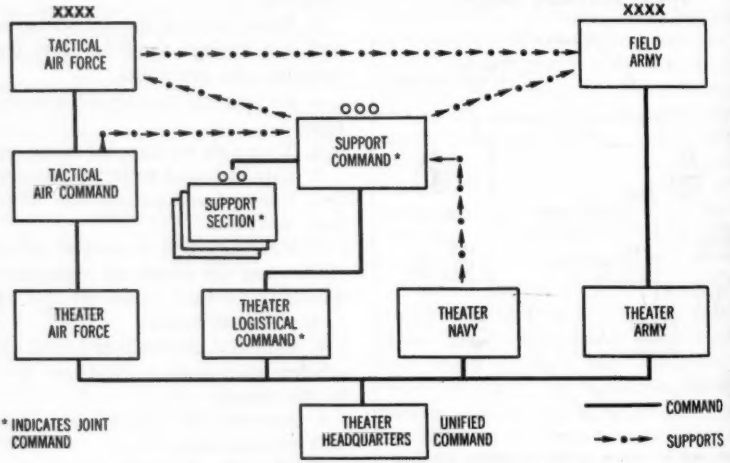
It is obvious that the operation of this unit must, of necessity, be a joint affair with the Navy hauling by water, the Army by land, and the Air Force by air, each an integral part of the supply system. In order to provide the maximum unity of effort and to effect the greatest economy of force, the organization and its operation will be multiservice in all aspects. It can readily be seen that the organization and operational procedures for each unit will require considerable study and

detailed planning by highly qualified logistical and technical service personnel. A general concept of such a unit is presented on Figure 3.

It will be noted from this figure that area support commands are established on the basis of one per field army and tactical air force. Each area support command will control a variable number of support sections to handle the logistical task. This concept establishes support sections on the basis of one per two to four divisions and proportionate Air Force units. The support sections are the operational part of the area support command. The airfield complexes in each of the support sections should be established to provide flexibility in the event that one or more of the airfields are destroyed by enemy action. It is conceivable that the loss of one or more airfields, or even an entire support section, could force the theater support commander to channel supplies from a more remote section in order to fill the needs of the combat units.

While area support commands and support sections are provided on the basis of one per field army and one per two to four divisions, respectively, the system is not inflexible. The problems of supply priority require careful planning in order to establish a workable system. Although certain existing doctrine already established by the operation of aircraft as a supplemental supply means may be used, major revisions are required when it is considered as the sole means.

The current doctrine of establishing priorities based on available aircraft must be carefully reexamined. Under current supply procedures with alternate means, any one means may be reduced without disastrous results. If, however, there is but one means, as is the case of ALOC,



THEATER NAVY AND TACTICAL AIR COMMAND ALLOCATE REQUIRED MEANS TO SUPPORT COMMAND; THESE MEANS NORMALLY WILL BE UNDER THE OPERATIONAL CONTROL OF THE SUPPORT COMMANDER.

FIGURE 3.

there is a certain minimum below which the support cannot fall without risking disaster.

Of first concern should be the establishment of this minimum and the assurance that it can be met. Next is a determination of peak load requirements to Army and Air Force units to ascertain if the system can support such requirements. These problems strongly indicate the need for a single commander for the Area Support Command supported by a joint staff and given all the necessary means to accomplish his mission.

It is at this level that the Air Force must provide, under the area support commander, the aircraft to fulfill the normal resupply lift. In addition, at theater level it seems reasonable to expect an additional lift capability, if required, to handle peak load requirements or furnish aircraft for airborne operations.

It is primarily to the rear of the combat zone that the problem of obtaining and maintaining classification of supplies must be solved. The support sections holding the required reserve plus safety levels will provide ample opportunity for orderly storage and classification.

The next critical point of maintaining this classification is in moving the supplies from depots to departure airfields and into waiting aircraft. It is here, and in the flight schedule, that the coordination must be effective. The Air Force, loading and delivering supplies to Army units in the combat zone, is not responsible for the grouping of supplies. However, if 10 different vehicle assemblies ordered by a particular unit will fit on one aircraft and are so loaded, it is a relatively simple matter to deliver them to the user. If these 10 items are placed on 10 different aircraft along with various other items, there arises a need for both storage and classification at the arrival airfield.

Undoubtedly, economical loading, emergency requisitions, aircraft abortion, and similar problems will cause certain irregularities in dispatch and delivery. However, by sound planning, unity of command, and with reliable communications this problem can be minimized, and thus eliminate the requirements for elaborate depots, large stockpiles, and their attendant personnel in the combat zone.

The installation and maintenance of the air-landing facilities must be the responsibility of the combat forces in the zone —but the actual operation of the installation itself should be under direction of the air facility commander. This should include operational control over units stationed at or near each facility for the purpose of operations, that is, engineer fire-fighting platoons, quartermaster service companies, and quartermaster petroleum supply companies. The medical installations in the combat zone are dependent on these bases for evacuation to the rear—but not for operations as such, and, therefore, need not be under operational control of the air facilities commander.

Certain items of equipment may bypass the support section and be introduced directly into the terminal air-landing facility. These items (see Figure 1) usually will be those in critical supply or those airlifted directly from the Zone of Interior.

Conclusion

Supply of large units by air for extended periods of time is not new nor is it revolutionary. History is replete with examples of successful ground actions supported solely by air. It appears expedient to develop the doctrine and techniques as well as the airlift to implement such a system. Concepts for the employment and supply of ground forces must be continually revived to meet actual and anticipated developments. Tactical, strategic, and logistical doctrine must reflect, and keep pace with, technical and scientific developments.

World's Northernmost Antiaircraft Defense

Lieutenant Colonel John H. Wiggs, *Artillery*
Commanding Officer, 549th Antiaircraft Artillery Battalion, Thule, Greenland

FAR above the Arctic Circle, on the icebound northwest coast of Greenland, is one of the most strategic bases in the northern hemisphere—Thule Air Base. The name is derived from the ancient Roman term, *ultima Thule*, meaning the northernmost part of the habitable world.

Frequently referred to as freedom's northern outpost, Thule is practically on top of the world, located almost halfway between the Arctic Circle and the North Pole.

The tactical gun positions of the Thule Antiaircraft Defense are located throughout the bleak and rugged terrain of the base, and, from these positions, artillerymen are afforded a "box seat" for the year-round Arctic phenomena.

Thule is somewhat unusual in its climatic resemblance to the "tried and true" Arctic weather regions. It can be compared to an Arctic desert since it receives very little precipitation.

Arctic Storms

Although Thule's annual snowfall is approximately 14 inches, strangely enough this is only a minor part of the annual accumulation. A great amount of "illegal" snow sweeps through Thule, flowing off the icecap during the "phase" periods. A phase, "The Arctic Hurricane," is a dreaded and sometimes disastrous weather condition that is peculiar to the winter season. It occurs usually when a strong foehn (interior) wind blows across the icecap down over the low-pressure coastal areas. With it, tons of fine, powdery snow are hurled like desert sand at the airbase, penetrating the slightest crack in buildings or equipment. As the phase wind descends from the high, cold interior, it is compressed and warmed, attaining velocities of from 25 to over 125 miles an hour.

Usually, when the wind reaches 50 or more miles an hour, depending upon accompanying temperatures and visibility, the phase condition necessitates that all personnel be confined to adequate shelter for the duration of the blow.

The phase usually is over within 24 hours and rarely lasts more than three days. During this time of emergency, however, on-site antiaircraft commanders are responsible for the security of all equipment, personnel, and provisions for emergency rations.

The sudden fury of these storms, despite advance precautions, occasionally will isolate personnel from their unit areas. In this event, since they are always adequately clothed for Arctic survival, they stop travel, seek shelter, and follow Arctic indoctrination to "stay put and survive."

After the phase has run its course, the digging out process begins and the artilleryman resumes normal operations.

Arctic Antiaircraft Operations

In this remote Arctic setting, Thule's antiaircraft fire units stand ready for any enemy attack—constantly alert for imme-

The weather and environment pose many special problems relating to maintenance, operations, and training activities conducted by United States antiaircraft defense units standing guard at Thule Air Base

diate action. Twenty-four-hour a day manning crews are prepared to fire the guns in a matter of minutes regardless of weather conditions. The antiaircraft artilleryman virtually lives with his weapon and each gunsite position is a self-contained unit. Maintenance checks, repairs, adjustments, and training are carried out on schedule in a never-ending cycle. The objective of operational readiness always is foremost.

At Thule, however, there are more handicaps and obstacles to overcome due to the impact of the weather on personnel and equipment. Maintenance and repair often must be conducted in subzero temperatures. Bare skin coming in contact with cold metal causes painful metal burns.

To maintain full operational readiness, weapons and equipment must be completely winterized and operated at frequent intervals to prevent moving parts from freezing. Standby power is applied constantly to equipment to prevent "cold soaking" and to facilitate an immediate changeover to full power when battle stations are announced. Heated ammunition storage bunkers are located near each gun so that sensitive fuzes can be maintained at constant operating temperatures. Since, under certain conditions of temperature and wind velocity, exposed flesh freezes in a matter of seconds, warmup points are situated at each gunpit in order that manning crews may be rotated after short periods of exposure to the elements. Everything possible is done to maintain a state of sustained operational readiness and to overcome the challenge of Arctic weather.

Lieutenant Colonel John H. Wiggs is a graduate of Texas Agricultural and Mechanical College. He served in the Southwest Pacific theater during World War II with the 45th Coast Artillery Battalion. In 1948-50 he was assigned to the Research and Analysis Department, Antiaircraft and Guided Missile Branch, The Artillery School. Subsequently, he was with the 764th Antiaircraft Artillery Battalion in the Canal Zone and was assigned as Assistant Professor of Military Science and Tactics at the University of Maine. He now is commanding officer of the 549th AAA Battalion in Thule, Greenland.

Training Activities

Training in the Arctic must be continuous and realistic. This is true not only for reasons of military efficiency, but also to foster high morale. It has been proved in the Arctic that a busy soldier does not have time for self-pity or loneliness. This philosophy is especially important during the long season of darkness when every individual must combat the powerful depressive factors of the Arctic environment—bitter cold, darkness, and constant remembrance of the comforts of home. These factors are made more vivid in the imagination by the area's vast emptiness and isolation. All personnel are not affected to the same extent, but in any case a continuing active training program seems to be the successful method of combating this Arctic ennui and general depression.

Firing Exercises

Due to its location and lack of human habitation, many realistic opportunities exist for troop training in the Thule Antiaircraft Defense. For instance, Thule probably is the only static antiaircraft artillery defense in the United States Army where gun batteries conduct all types of firing directly from tactical positions. This is a tremendous training expedient and a great morale booster for personnel.

On unknown aircraft tracks there are numerous occasions when trial fire is requested, granted, and completed prior to aerial identification and well before the unknown aircraft comes within range of antiaircraft weapons. Army service practices, velocity fire, verification patterns, and dynamic test courses also are fired from the tactical positions. The gun batteries conduct year-round firing exercises

and have an excellent opportunity for night firing due to the long dark season. Thule antiaircraft again is unique in that the batteries can conduct "night firing during the day" or, if you prefer, "day firing during the night."

Arctic Indoctrination

High in priority for training subjects is Arctic indoctrination. This subject is mandatory for all personnel during the month of September before the Arctic winter sets in, and thereafter all new replacements must receive their training within 24 hours after arrival in Thule. For those who desire a postgraduate course, opportunity is available for enrolling in the Icecap Survival Course which operates under the direction of the Air Force. Part of this course is bona fide practical work with the students required to live and survive on the nearby icecap for a 48-hour period.

Television is utilized for many training subjects. Gunsites are widely scattered but each one has a TV set so that instruction is conducted simultaneously throughout the defense. Through this media important subjects are brought to the immediate attention of every individual in the command.

A Logistical Problem

In spite of the many conquests of environment, Thule does present a tremendous logistical problem and challenge.

Maximum advantage is taken of the short surface shipping season to solve this problem. This season is a busy time and from July to September when the North Star Bay is ice free, thousands of tons of equipment, supplies, and petroleum, oil, and lubricants are unloaded at DeLong Pier. The unloading of these cargoes and subsequent transfer to base warehouses and storage areas is a job requiring the combined efforts of the Army and Air Force units at Thule. Consequently, during this period dock details are added to the already busy summer schedule of the antiaircraft units. The port operations must go on 24 hours a day until the job is completed and the short shipping season is over.

In addition to surface shipping, the huge *C-124 Globemasters* of the Military Air Transport Service maintain a busy cargo transporting schedule throughout the year keeping the base continually supplied with the necessities of life, including a balanced diet of fruits and meats, and eagerly awaited mail from home.

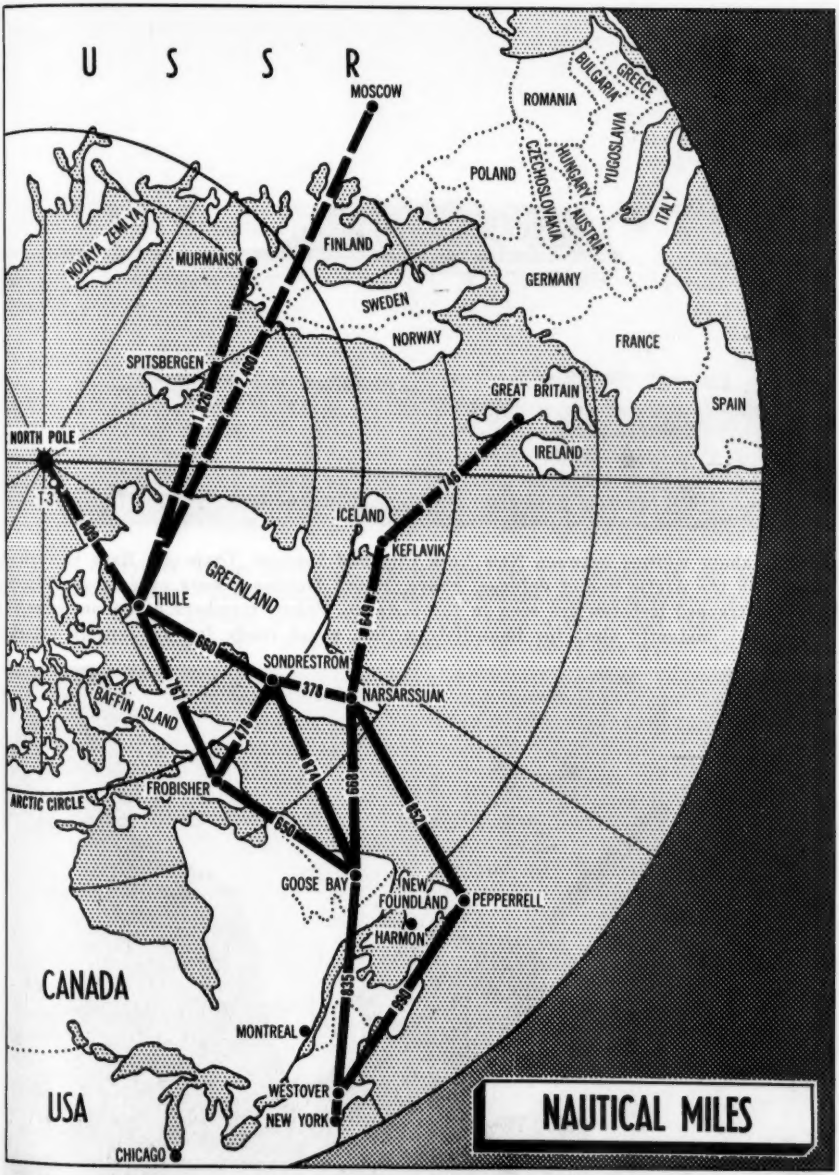
International Aspects

International relations with the Danish Government are an important part of antiaircraft operations at Thule. From a governmental standpoint, Greenland officially is Danish and, as such, has its own government as well as two representatives in the Danish Parliament.

A Danish liaison officer is stationed permanently at Thule Air Base and is the official representative of Denmark. Close coordination with the Danish liaison officer is necessary to secure firing clearances for all antiaircraft target practices. Although Eskimos do not live within the range of antiaircraft weapons, many of these people do hunt seal, walrus, and polar bear in or about the Thule area and, therefore, must be warned in regard to all impact areas and firing periods.

The Future

In the future the effectiveness of this vital stronghold on the frontline of the global frontier will be increased by the addition of the deadly *Nike* missile. Tomorrow, in the silent shadow of snow-covered mountains and nature's icy palisades, the ageless glaciers will move seaward while the nose of the "Goddess of Victory" will point skyward as formidable warning to all potential enemies that those below are prepared to defend if an attack comes.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ARCTIC CIRCLE
FROBISHER
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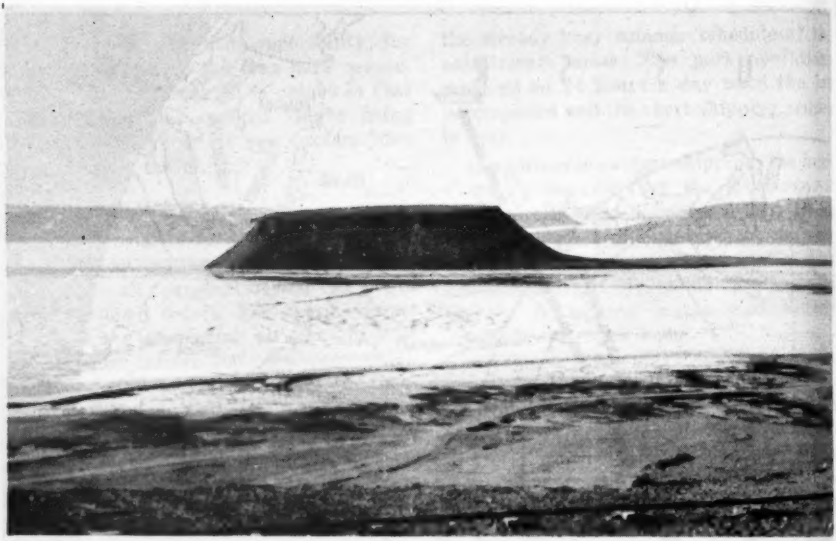
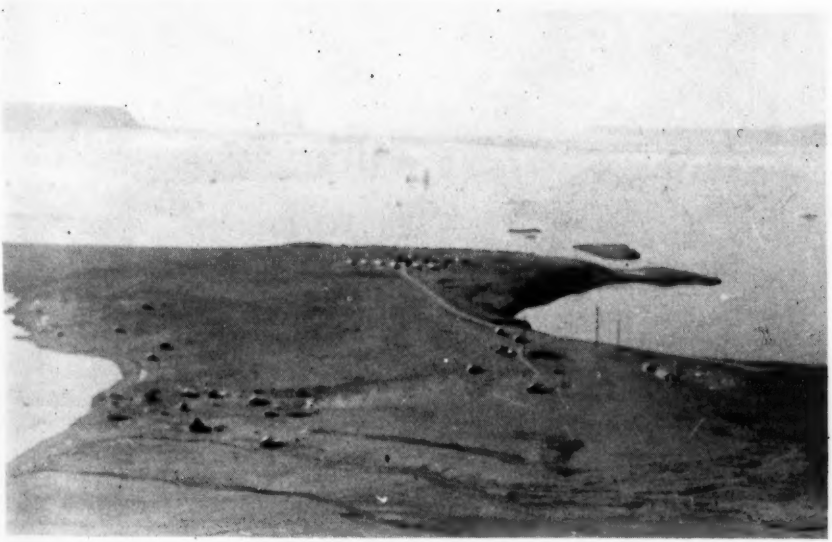
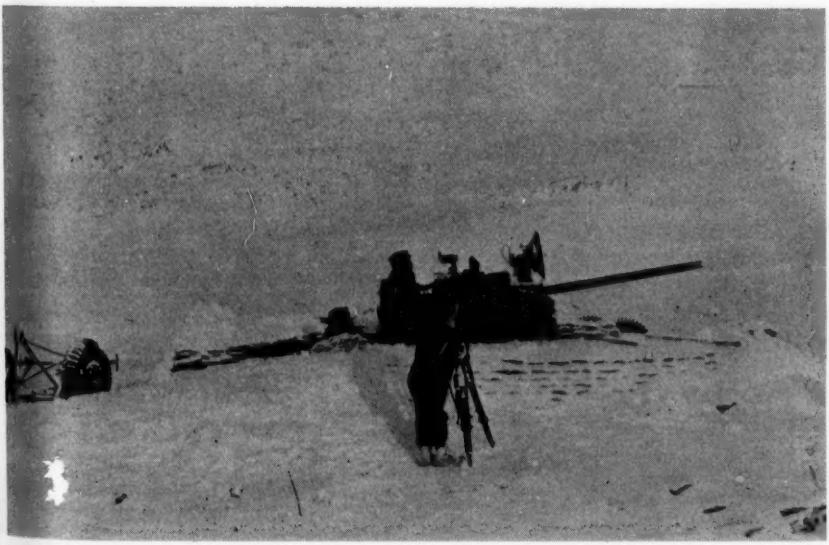
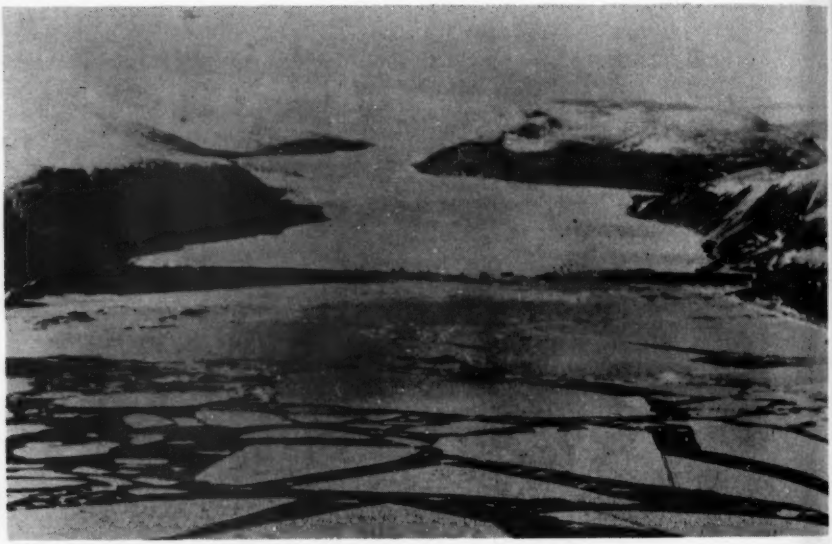


Located about midway between New York City and Moscow, Thule Air Base is a vital outpost in the Arctic line of defense. Above, Mount Dundas towers over frozen North Bay and trapped icebergs are seen in the distance. Below, members of an antiaircraft gun crew, constantly alert for immediate action, stand ready for any enemy attack.

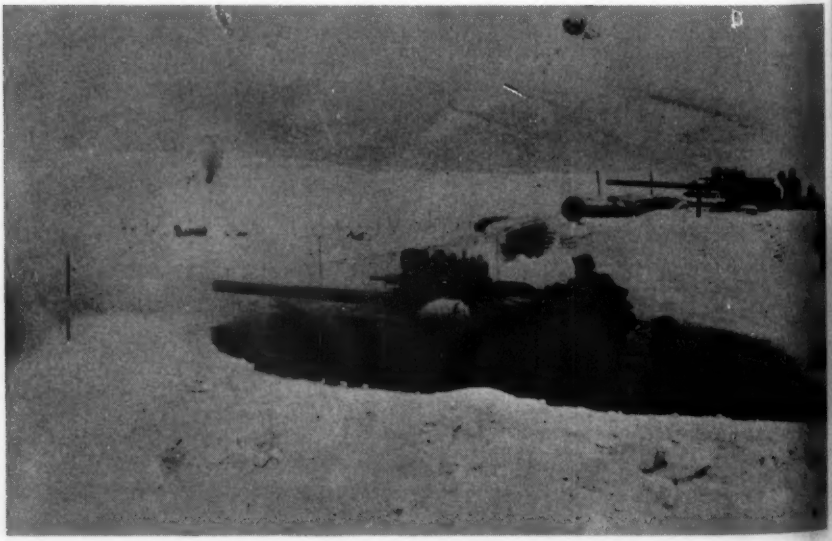


The river valleys of Thule remain dry throughout the year except in the brief so-called summer months—June through September—when the melting snow swells the river beds. Above, during summer period huge icebergs form a continuous frozen armada. Below, a sentinel keeps watch beside a gun battery in "top of the world" AA defense.





The breaking up of ice on the fiord indicates the beginning of summer glacial activity when thousands of huge icebergs break off and float out to sea. Above, an aerial view of a nearby glacier in the Thule area. Below, antiaircraft gun crews limber up during a direct fire training mission being conducted in the remote Arctic setting.



Weapons and equipment must be operated at frequent intervals to prevent moving parts from freezing. Above, a machinegun crew firing a normal training mission from tactical position during subzero temperatures. Below, a mortar, organic to antiaircraft defenses in Thule, engaged in ground defense fire mission.—Official USAF photos.

The Impact of Atomic Weapons On Offensive Operations

Lieutenant Colonel Dale D. Hogoboom, Jr., *Infantry*
Faculty, U. S. Army Command and General Staff College

This article is in consonance with current Department of the Army doctrine as taught at the U. S. Army Command and General Staff College.—Editor.

WITH the advent of mutual deterrence based on capabilities for massive retaliation the requirement for a modern ground force capability to conduct atomic supported tactical operations becomes increasingly critical. This ground force must have the capacity to launch offensive operations exploiting atomic support and to continue such operations in the face of enemy atomic attack.

The impact of atomic weapons on tactical operations is due to the ability to create overwhelming superiority through proper employment of this new firepower and the corresponding need to avoid the losses associated with effective employment of atomic weapons by the enemy. A great deal of effort currently is being directed to the development of organizations suited to the requirements of the atomic battlefield. However, general observations relating to tactical operations can be made without reference to any particular organization.

One major difficulty in consideration of this subject is associated with the widely differing situations which may prevail depending upon the number and sizes of weapons available either to friendly forces or to the enemy. For example, the use of single small-yield weapons at infrequent intervals creates one set of conditions which may not require much change from nonatomic tactics. At the other extreme, the employment of large numbers of weapons of all yields creates still another condition which requires drastic change. This discussion will not attempt to cover the entire range of possible conditions but will be confined to an environment associated with atomic weapon employment somewhere between these two extremes. In the conditions on which the discussion will be based, atomic weapons are employed selectively, as a normal component of combat power, against targets of tactical significance.

Integration of Fire and Maneuver

Successful offensive operations require the concentration of superior combat power at the decisive place and time. Although the advent of atomic weapons has not changed this fundamental, the tremendous firepower represented by the atomic weapon facilitates achieving this superior combat power. These weapons are not absolute in the sense of assuring victory by themselves, but they are a powerful addition to the weapons family.

The great power of atomic weapons requires a revised approach to the coordination of both maneuver and fires and a careful analysis of the ratio of combat troops and firepower essential to future battlefields

The maneuver plan and the atomic fire plan complement each other and should be formulated concurrently. In the past, commanders generally have planned the maneuver and then developed a supporting fire plan. The great power of atomic weapons requires that the two plans be developed concurrently even though one or the other generally will exercise a governing influence over the entire plan. As a first step the commander must consider and determine whether the maneuver or the atomic firepower has the greater influence on the over-all plan and then proceed to integrate the two.

An appreciation of the atomic weapons effects is required to assure taking full advantage of the opportunities created by these effects, while at the same time minimizing the obstacles. Atomic firepower will permit maneuver which would not be possible with nonatomic fire support alone. The maneuver plan must provide for movement through or around the target area under the conditions which are predicted will exist as a result of atomic fires. Plans for movement through a target area should be based on defensive strength expected to exist after the atomic strike. Predicted radiological contamination in the target area will require special considerations to avoid casualties among friendly forces. Tree blowdown and destruction of built-up areas may result in obstacles to maneuvering troops.

There is a special requirement for flexibility which will permit modifying plans as may be necessary in the event of variations in predicted weapons effects. The basic plan should conform to the conditions which are expected to prevail after the atomic fires have been delivered. Inasmuch as expected conditions may not actually occur, plans must permit shifting to alternate actions based on the actual conditions which may be more or less favorable than those originally predicted.

Distribution of Force

Fire support is an essential element of combat power. The atomic weapon is a powerful addition to this support. With this increase in the fire support element the size of the maneuver element can be reduced and still provide the necessary over-all combat power. For example, assume that the required combat superiority for seizure of an objective defended by a reinforced enemy company indicates the use of a battle group. If atomic weapons can reduce the combat effectiveness of the enemy defending the objective to a platoon, the attack might be made with a company. It is not considered possible to establish any absolute ratio for the reduction of troop units by an increased use of firepower. This must be determined in any specific situation by application of the varying factors appropriate to that situation.

Reduction of troops by the increase of firepower is particularly significant in light of the need for reducing vulnerability to enemy atomic weapons by increased dispersion. The need for minimizing vulnerability and exposure to enemy atomic attack indicates the requirement for careful consideration of the proper ratio of troops to firepower in achieving the required over-all combat power. However, complete substitution of atomic fires for troop units would be very rare in view of the requirements for the presence of troops to accomplish most missions.

Atomic fires facilitate achieving the su-

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periority usually contemplated for main attacks. Where available in adequate numbers, atomic weapons may facilitate providing the strong fire support required by secondary attacks to compensate for lack of other means. In addition, they may permit assigning deeper objectives to secondary attacks.

In situations where large numbers of atomic weapons are available, after providing adequate weapons to the main attack and to the reserve, it may be possible to provide substantially more than the usual "minimum essential" means to secondary attacks. The mission of the secondary attack then should be expanded to take full advantage of the increased means available to it. The secondary attack may approach the main attack in means and, therefore, in objective and mission. This results, in effect, in an exploitation by the entire force without resort to secondary attacks to fix and to deceive the enemy.

Reserve

Although reserves have long been considered the sum of fires and troops, atomic fires give greater significance to the impact of firepower. To some degree this powerful weapon offsets the requirement for troops in the reserve just as in main and secondary attacks. On the other hand, where the enemy capability of employing atomic weapons is one likely to be adopted, provision must be made for a strong reserve of both weapons and troops. A troop reserve is necessary to maintain continuity of the operation in the face of heavy loss among any task element of the attack force. In addition to the flexibility provided by a reserve of troops, there is that provided by the reserve of atomic weapons. Although atomic fires do not have the same flexibility as nonatomic fires they usually can be shifted with greater ease to meet an enemy threat than can a reserve of troops. The power of the weapons may actually permit some lesser degree of the flexibility provided by a troop reserve than would otherwise be required.

In this connection it should be pointed out that the atomic battlefield involves conditions requiring a high degree of flexibility. The likelihood of rapidly changing situations on the atomic battlefield should be recognized. With atomic weapons either friendly or enemy forces can so change the situation that it will bear little resemblance to that which existed previously. Plans must provide a degree of flexibility and control which will permit prompt reaction to these rapidly changing situations.

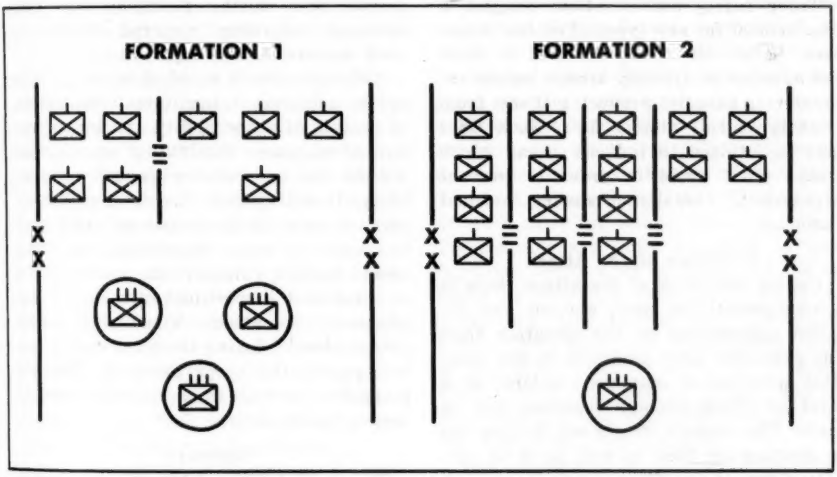
The reserve must be dispersed and still be available for immediate employment. This demands great mobility. Conversely, friendly use of atomic weapons may permit more definite visualization of the likely employment for the reserve. The reserve then can be located to conform to the plans for its employment with less attention to the necessity for its being available for employment throughout the zone. However, the greater the enemy atomic capability the more important it becomes to locate the reserve where it can react to any enemy atomic attack.

Closely related to the matter of distribution of force is the selection of suitable attack formations. The possible need for immediate employment of the reserve suggests special consideration of that requirement in the selection of an attack formation.

The sketch portrays two possible formations for the attack. In comparing the two formations it will be noted that each employs five companies in the attack and each has the same total force in reserve. The principal difference arises from the fact that in Formation 1 the bulk of the reserve is under the control of the division commander, while in Formation 2 a substantial part of the reserve is under the control of the battle group commanders. In Formation 2 the reserve can be employed more rapidly than would be pos-

sible in Formation 1, although such employment would result in piecemeal commitment.

Formation 2 in the past generally has been rejected because of its lack of a strong reserve under the control of the division commander. However, in atomic warfare the division commander might rely largely on a reserve of atomic weapons to provide the means to influence the operation once it has been launched. The ability to employ the reserve quickly may be an important advantage on the atomic battlefield with its rapidly changing situations.



Coordination and Control

With regard to coordination and control, it appears that atomic operations will be characterized by a lesser degree of control than has frequently been the case in the past. Subordinate commanders must have latitude which permits prompt reaction to rapidly changing situations and unexpected opportunities. Probably there will be more frequent use of the so-called "mission type" orders which give to subordinate commanders the latitude to act on their own initiative in the absence of specific instructions from higher headquarters. At the same time, the concept of operations becomes more important since it ensures that all actions taken by subordinate commanders, in the absence of specific instructions, contribute to attainment of the over-all objective of the operation.

The dispersion and large areas covered by atomic supported operations complicates the problem of maintaining command and staff supervision through personal visit and inspection. There is a requirement for the designation of alternate headquarters capable of rapid assumption of control should the primary headquarters be destroyed by enemy atomic attack. Improved communications equipment and techniques are required to ensure continuity of communications over the large areas of operations and in the presence of wide areas of destruction from enemy atomic attack.

Objectives will be deeper and zones wider to take proper advantage of the increased capabilities of units when supported by atomic weapons. The optimum time for delivery of atomic fires will have

an important bearing on the selection of times of attack. After the atomic preparation, time must permit comparison of the results obtained with the results predicted, in order that necessary modifications of plans can be made before units actually are committed to the attack. The problems of troop safety frequently will preclude the movement of units during the atomic preparation as has been possible during nonatomic preparations.

Troop safety considerations suggest a requirement for new types of control measures. Safety lines may be used to limit the advance of friendly troops before encountering casualty producing effects from friendly on-call atomic fires. Such lines may be utilized to indicate areas which troops must avoid in order to prevent exposure to casualty producing residual radiation.

Execution of the Attack

During execution of the attack there is a requirement for more current and detailed information of the situation than has generally been available in the past. This information must be available at a level at which prompt decisions can be made. The enemy's efforts will be directed to limiting the time he will be in vulnerable dispositions. There must be prompt decisions if targets are to be engaged before they disperse. In addition, troop safety problems require the availability of detailed, current knowledge of friendly dispositions.

Continuous movement provides a measure of passive protection from enemy atomic attack. The momentum of the attack must be maintained to prevent the enemy from slowing or stopping friendly forces in order to obtain more effective employment of his atomic weapons. Troop or atomic reserves may have to be employed on the basis of less information than has been expected previously. Piecemeal employment of these reserves often may apply the additional combat power required to maintain or restore the momentum of the attack.

In order to facilitate prompt reaction to rapidly changing situations, attack planning should include visualization of the operation from the assembly areas to the final objectives. Such visualization should attempt to ensure carefully scheduled movement from safely dispersed assembly areas, massing only as long as is necessary, stopping only when safely dispersed, and moving promptly into dispositions affording required dispersion upon seizure of the objective.

Although this is an ideal which seldom can be achieved, it facilitates anticipation of periods of vulnerability and incorporation of measures eliminating or minimizing the risk associated with such vulnerability. It will permit the development of plans to react to the situations which may be created by enemy atomic attacks. Plans should include vulnerability studies based on predicted dispositions during critical phases of the attack. Visualizing enemy atomic attacks during these critical phases will permit the preparation of alternate plans to cope with these situations should they actually occur.

Summary

The great power of the atomic weapon requires a revised approach to the coordination of maneuver and fires and a careful analysis of the ratio of maneuvering troops and firepower to obtain the best possible balance in achieving the required total combat power.

The potential threat of an enemy atomic capability requires continuous consideration of friendly vulnerability and measures to counter the results of enemy atomic attack. Atomic weapons permit great latitude in the development of tactical plans, as well as an unprecedented powerful means to influence the attack once it has been launched and create the requirement for new or modified application of offensive fundamentals.

THE RETREAD

Major Reginald Hargreaves, *British Army, Retired*

There's many a good tune played on an old fiddle.
—Proverb

NO COUNTRY with pretensions to being a democracy can hope, in peacetime, to maintain fighting forces adequate to its requirements in the event of war. As Wellington pointed out, "You can't have a *small* war"—and what was true in his day, which saw the first acceptance of the concept of "total" war, has even greater validity in this present uneasy era, when a minor clash in some remote corner of the world could so easily lead to global conflict.

But to sustain in years of peace—however queasy and uncertain—the tremendous force required for participation in worldwide hostilities, would have the inevitable effect of lowering the general standard of living to a level which a population of free and thriving people would find entirely unacceptable.

In terms of living standards, a totalitarian country, such as Russia or China, can maintain only huge fighting forces by denying its civil population virtually all those day-to-day amenities which make life worth living. It is only because the average Soviet citizen has been dragooned into acceptance of a drab, undernourished, joyless way of life, year in and year out, that the men of the Kremlin are in a position to put 400 divisions into the field within 30 days of mobilization.

In Russia, real wages—which are the basis of living standards—are at this moment only three-quarters of what they were in 1927-28; and even at that period they were considerably lower than those prevailing in 1913 when the Russian worker was just beginning to win the right to a fair reward for his toil. In effect, the citizen of Soviet Russia is accorded no choice in the matter of "guns or butter" —with or without his approval, guns are given priority every time.

Where the democracies are concerned, however, it is extremely difficult to secure acceptance of the contention of that good democrat, Adam Smith, that, "Defense is of much more importance than opulence." Democracies are quite prepared to pay for guns—quite a lot of guns—but not so many as would threaten their ability to purchase a thoroughly adequate supply of butter. And who shall blame them? One of the advantages of living in a plutodemocracy is that you *do* enjoy a higher standard of living than that accepted under Communist dictatorships.

But how best to ensure that in the event of war there will be no shortage of guns or, even more important, of the men to handle them, remains the problem for which every democratic government is under abiding obligation to seek a satisfactory solution.

Since *matériel* can be stockpiled, the real question is one of manpower.

Reserve Pool

In countries where a sound system of universal national service prevails, the constant stream of men passing to the Reserve, after their statutory tour of active duty, serves to form a pool of manpower of the very highest order. They are men who have benefited by the very lat-

est technical instruction. Many of them may even have borne their part in one of those "cold war" hot wars—such as Korea or Malaya—by which the Kremlin contrives to foment the maximum of trouble at the minimum cost to itself.

It is to this pool of trained, healthy young manhood that the authorities would turn to bring the existent formations of the standing forces up to strength and to furnish the hard core of the war-begotten divisions by which such forces would be supplemented.

Behind these primary formations there is a second line on which to call, in the shape of the National Guard or Territorial units who welcome not only the man who has completed his draft service, but older men, veterans of the war of 1939-45, who are still fit and enthusiastic enough to keep themselves trained and ready.

Beyond them again are the men in the more remote categories of the Active Reserve, whom a "refresher" course or two will render fit—both mentally and physically—once more to take their place, however modest, in the line of duty.

But even with this widespread amplification of the standing forces, there still remain a great number of jobs—dull, exacting, unrewarding jobs, for the most part—whose fulfillment it would be folly to leave to men capable of more positive service in the national cause. It is to undertake these that the call goes forth for the "retread," the "dugout"—the officer or noncommissioned officer who has long since retired from the service, and put away his uniform as something that is no more than a nostalgic reminder of days "not likely to be lived o'er again."

There are many reasons which persuade men to retire from a service to which they have devoted some of the best years of their lives. In the first place, there is the arbitrarily fixed age limit which automatically removes the individual who has reached it from the Active List. It is only in very exceptional cases that this age limit is extended. Although many instances can be cited where the application of the rule is seen to be both harsh and wasteful, it is only by its rigorous imposition that the even flow of promotion can be maintained. In theory, British field marshals and admirals of the fleet, like marshals of France, never retire, but "remain available" until their demise. In the days before the War Between the States the rate of promotion in the small United States Standing Army was so discouragingly slow that many officers retired whose names were to become household words a few years later. (The principle might, with very great advantage, be extended to the no less exacting field of politics where, at present, senility would appear a veritable qualification for promotion rather than an admirable reason for retirement.)

Ill health and the after effects of wounds account for the retirement of a number of men who otherwise would have been capable of rendering many more years of valuable service. The heirs of the owners of valuable businesses or substantial estates also may find it expedient to curtail a service career the better to discharge the responsibilities of inheritance. Indeed, in England, at one period, the heir to a wealthy peer or landed proprietor would enter one or other of the services with the full intention of retiring upon attaining

The "retread" or "dugout"—retired officer or noncommissioned officer—comes forward in emergencies to serve in whatever capacity can be reconciled with his previous record and professional experience

captain or major's rank, or their naval equivalent. Thereafter, his experience with the Regular forces helped to give something of the professional touch to the Yeomanry or Territorial unit in which he was prompt to obtain a commission.

It is from the ranks of this heterogeneous company that the "retread" or "dugout" comes forward in times of emergency, only too eager to serve in whatever capacity can best be reconciled with his previous record and experience, his years, and his contemporary state of health.

Some—the younger and more physically fit—are lucky enough to go back to service with those fighting formations from which they have not long been parted. Others of slightly older vintage are posted to training formations where their experience of the day-to-day business of preparing the recruit for warfare—keeping a body of men clothed and fed, and training them for their work on the right lines—proves absolutely invaluable.

For the even older generation there still are plenty of tasks in which their experience and adaptability can be put to fruitful use, and with a saving in more youthful manpower that in itself constitutes no insignificant contribution to the general cause. As public relations officers, as "chairborne" intelligence officers with the Air Force, as commandants of prisoner of war camps, and in scores of unexciting but essential depot jobs their services fit into the general pattern of expansion, giving it stability and that quality of professionalism which turns a horde of well-intentioned but uninstructed recruits into a formidable fighting force.

A Famous Dugout

For the most part the "retread" toils away "unhonored and unsung." His opportunity to hit the headlines virtually is nonexistent. But the few who have attained fame, have achieved it on a scale to put them in the very forefront of history. Very clearly at their head stands the first President of the United States —General George Washington.

In 1751, at the age of 19, Washington was appointed adjutant general of one of the four military districts of Virginia, with a "provincial" commission in the rank of major. His first experience of active service came when he was selected by Governor Robert Dinwiddie to bear the government's peremptory request for the withdrawal of the obtrusive French from their fortified posts in the Ohio Valley. The demand being contemptuously rejected, the young major surprised a party of the intruders inflicting a number of casualties and making the rest of the party captive. But the French returned in strength and, besieged in a hastily erected entrenchment named Fort Necessity, Washington learned the hard way that to build a strongpoint in a hollow commanded on every side by high ground is to put a premium on disaster. Forced to surrender, but permitted to march out with "the honors of war," the youthful major was consoled—by promotion to colonel—for the unfortunate ending that had attended a gallant enterprise.

Obviously, the difference between the border settlers and the French could not be left undetermined, and the British Government announced its intention of supporting the demands of the colonists by reinforcing them with a body of redcoats under the command of General Edward Braddock.

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It was at this stage that Washington discovered that officers holding a "provincial" commission were to rank under those of the Regular Army. Strongly resentful of the idea of being under obligation to take orders from men who probably had seen less of actual fighting, he promptly resigned. So it was as no more than a "volunteer" that he accompanied Braddock's disastrous campaign to the Monongahela, intervening only when it became clear that nothing but a knowledge of the methods employed in "Indian fighting" could hope to save something out of the wreck.

With Braddock's costly setback, it was obvious that the British redcoats were not the right kind of troops for the bush-whacking type of warfare characteristic of the frontier. Patently, the only chance of retrieving failure was to hand over the command to a man with a sound knowledge of local conditions, and in a position to evoke the loyalty and confidence of the provincial troops on whom would fall the brunt of the fighting. So, very sensibly, George Washington was called out of retirement, appointed colonel of the 1st Virginia Regiment and commander in chief of all the provincial forces in the state —one of the youngest and most illustrious "dugouts" of whom there is record.

Continental Army

When Washington was again dug out of retirement to replace the venerable but somewhat fossilized Artemas Ward as commander in chief in June 1775, his Continental Army contained more than one "retread." Horatio Gates, appointed adjutant general with the rank of brigadier, had served as a British officer in Europe, and later had been wounded when disaster overtook Braddock on the Monongahela. An intriguer who sought to supplant Washington in chief command, he was described by one of his own men as "an old granny." Certainly, the dilatoriness he displayed at Trenton was matched by the extreme caution of his dispositions at Bemis Heights. Indeed, the credit he gained for his victory over General John Burgoyne at Saratoga should more properly have been given to farsighted Philip Schuyler and the fiery Benedict Arnold.

Arnold himself had served in the ranks of the British Army, from which he had twice deserted, while the erratic, prickly-tempered Charles Lee had once commanded, on active service in Portugal, the regiment of Light Dragoons[1] raised by "Gentleman Johnny" Burgoyne.

Chivalrous Richard Montgomery, destined to meet an untimely end beneath the walls of Quebec in the first year of struggle, had served with the British 17th Foot (Leicestershire Regiment) retiring in 1772; while "Old Put"—Israel Putnam—had fought as a provincial officer throughout the French and Indian War, retiring thereafter to his farm at Pomfret, Connecticut.

Thomas Conway was a "dugout" whom it would have been better not to disinter, since most of his energies were expended on intriguing against Washington. But it was a very different story with regard to that grand old warhorse, Baron Frederick von Steuben.

The baron had done most of his service under Frederick the Great, and with the end of the Seven Years' War he had retired to live the quiet, modest life of a country gentleman on his estates in Swabia. It was Silas Deane, the young Republic's representative in France, who persuaded the baron to proceed to North America to help train the Continental Army; it was at Valley Forge, when that Army's fortunes were at their lowest ebb, that Von Steuben took up his task.

By combining authority and a very human personal quality, Von Steuben first

[1] The 16th, subsequently the 16th (Queen's) Lancers, now a unit of the Royal Armored Corps. Lee also had been with Braddock, with Prideaux at Niagara in 1759, and with Amherst at Montreal in 1760.

won the confidence and then the obedience of all who came under his command. He even managed to persuade men who hitherto had used their bayonets to grill steaks, that with training they could be put even to a better use. In short, this rugged, patient Swabian "dugout" "bestowed upon the ragged troops the greatest gift that they could have received—the gift of discipline." [2]

The Little Corsican

A man of whom his instructors affirmed that he "would make an excellent sea officer," but who actually joined the artillery and was subsequently struck off the Army List five times, certainly qualifies for the category of "dugout." Yet such was the early experience of the little Corsican who went through the military academy at Brienne and Paris under the name of Napoleon Buonaparte. (Napoleon retained the Italianate spelling of his name until 1796.)

As a second lieutenant, the future conqueror of Europe was dismissed from the service in 1791 for overstaying his leave. Restored to the Army as a captain in the following year, within a 12-month period he had distinguished himself at the siege of Toulon, and even achieved the temporary rank of *général de brigade*. Within eight months he had been suspended by the political commissars with the Revolutionary Army and put under arrest. Restored to his rank once more, his refusal to accept an appointment to command a second-rate infantry brigade led to the summary removal of his name from the list of general officers eligible for active employment.

Living on a pittance in miserable lodgings in the *Rue de Mail*, for weeks he roamed the streets of Paris without employment, a lean figure in a shabby blue uniform coat and cracked top boots, with the long, lank hair framing a pale, hollow-cheeked face in which the somber eyes burned with a sullen resentfulness.

It was not until October 1795 that Napoleon was given the chance to show his quality. The 48 sections of Paris were in violent agitation against certain proposed changes in the country's legislation, and the initial attempts made by the National Convention to suppress the rioting in the streets met with scant success. It was then that the powerful deputy, Paul Barras, recalled the resolute little artillery officer who had shown such determination and resource at the siege of Toulon. The little Corsican promptly was dug out of obscurity and given a free hand to deal with the situation, under the nominal supervision of Barras.

Napoleon's dispositions were as swift as they were masterly. Working all through the night, by dawn all the approaches to the Palace of the Tuileries were commanded by cannon. When the mob defiantly marched to attack the seat of government, the youthful artilleryman coolly gave the order to fire. The insurrection was ended, blown away, as he grimly remarked, "in a whiff of grapeshot."

At the time Napoleon was a "dugout" just over 26 years old, and from that moment he continued to scale the ladder of fame until disaster overtook him, 20 years later, on the rain-soaked field of Waterloo.

Wellington

Napoleon's great opponent and eventual conqueror, the 1st Duke of Wellington, also qualifies technically for inclusion in the ranks of the "retreads."

In 1797 Colonel Arthur Wellesley, as he then was, had taken his regiment, the 33rd Foot, to India. For seven years he played a successful part in a series of campaigns against the turbulent, Tipu Sahib, Sultan of Mysore, and the fiery Marhattas; being made Governor of Mysore, promoted to major general, and in-

[2] Major W. A. Ganoe's *History of the United States Army*.

old granny." Certainly, the dilatoriness he

at Niagara in 1759, and with Amherst at Montreal in 1760.

vested with the insignia of a Knight Companion of the Most Honorable Order of the Bath. For all that, the jealousy of his seniors in rank, together with the frustration he experienced at the hands of the authorities in his efforts to establish firm and stable conditions of peace, persuaded him to apply for leave to return home.

But the man whom India had feted as the victor of the battle of Assaye, soon discovered that in England he counted as no more than a "sepoy general" whose claims on patronage virtually were negligible.

In disgust at his blighted prospects, in April 1806 Wellesley stood for election, being returned to Parliament as a member for the ancient coast town of Rye. For a time he was content to take his share in the work of the House of Commons. But a change of government brought him the offer of the post of secretary to the lord lieutenant of Ireland, and at the age of 38 he repaired to Dublin to take up his civilian duties.

Wellesley had not been many months in his overseas office, however, before he took a little vacation—to command a division in the successful expedition against the Danes. Less than a year later he finally was dug out from his files and deed boxes to take command of the expedition to Portugal, which saw the beginning of that amazingly victorious career that reached its climax when, on the ridge at Waterloo, he raised himself in his stirrups to give the rousing order, "The whole line will advance!"

The stouthearted veteran, Marshal Gebhard von Blücher, whose timely intervention at Waterloo tipped the scales in Wellington's favor, was even more of a "retread" than the Iron Duke himself. His first retirement had been in 1778, after a modestly successful career as a cavalry officer, and for 15 years he remained in obscurity, farming his estate. With the outbreak of the French Revolutionary War in 1793, however, he was dug out to take command of a regiment of Hussars, and by 1806 had been promoted to the rank of lieutenant general. It was after the Auerstedt-Lübeck-Stralsund campaign that he again shed his uniform, and it was from a remote property in Silesia that in 1811 he was summoned to resume command of the Prussians with the brilliant but opinionated Gneisenau as his chief of staff. In 1815 he was in his seventy-third year, but even a bad tumble from his horse, as Napoleon's troops swarmed into Ligny, failed to put him out of action.

Crimean War

In the long years of peace that followed Napoleon's downfall, men who were no more than captains or majors in the campaign of 1815 slowly crept up the ladder of promotion until, at an age that inevitably took toll of their vitality and adaptability, they reached the senior positions of command. It was a period wherein the present-day age limits for retirement virtually were inoperative.

Thus in the Crimean Campaign of 1854-56 the combined ages of Lord Raglan, the commander in chief, and his five principal officers totaled 389 years, only one of them —Sir George Brown, commanding the Light Division—having been dug out to resume active service. He had resigned less than three years before the outbreak of hostilities. One remarkable "retread" was the commander of the Turkish contingent, Omer Pasha. Originally an officer in the Austrian Army, he had turned Mussulman on his appointment as preceptor to the Turkish Prince who became the Sultan Abdul Mejid of the Crimean War period. With the termination of his tutorial responsibilities, he had entered the Turkish Army and speedily attained general's rank. But as a "dugout" of 48 he was a mere babe compared to the venerable Sir Edmund Lyons, born in 1790

Major W. A. Ganoe's *History of the United States Army.*

sore, promoted to major general, and in-

and in command of the British Fleet in Russian waters. After a distinguished naval career in the West Indies, Lyons had given up his commission to enter the diplomatic service. Over a period of 17 years he made his mark in more than one foreign court. With the outbreak of hostilities with Russia his plea for reemployment brought him the command of a ship and eventually that of the fleet. Full of fire and energy, the fact that the Navy's opportunities for usefulness were limited in no way deflated his ardent spirit. Not only was he prepared to bombard anything, anywhere, at the shortest notice and the closest possible range, but it was due to him that the battery of heavy naval guns was landed and kept in brisk action on the "Upland."

All in all, the two "dugouts"—Omer Pasha and Admiral Lyons—possessed more initiative and dash than the rest of the leaders could generate among them.

Civil War

With so small a Standing Army, it was only natural that the enormous expansion brought about by the War Between the States should have called many a "dugout" back to active service. General George B. McClellan, for example, had been a West Pointer who had resigned his commission to go into railroad management. General Joseph Hooker, another West Pointer, was farming when hostilities broke out; while General Henry W. Halleck had been practicing successfully as a lawyer in San Francisco. William T. Sherman dropped an academic career once more to don uniform; Ambrose E. Burnside abandoned a promising business connection to follow suit. The taciturn Ulysses S. Grant also had started life as a West Pointer, and had gone on to fight in the Mexican War, riding under fire in the Comanche fashion, clinging to the saddle with one leg while holding his head and body close to the side of the horse away from the enemy. A dour, hard drinker, he vowed he would quit the Army should whiskey ever get the better of him. When, in due course, it did, he resigned his commission, with the gruff comment, "Whoever hears of me in 10 years will hear of a well-to-do old Missouri farmer."

But it did not prove quite so easy as he thought it was going to be. There were lean, tough times which were reflected in the name of his homestead—Hardscrabble. When war came to disrupt old friendships and sever old loyalties, Grant was making a difficult $800 a year, although his prospects were brightening. He wrote at once to Washington offering his services. No reply being forthcoming, he went to Springfield, Illinois, where he was promptly made a colonel and encouraged to take his regiment to Missouri. His rise, thereafter, was slow and subject to many setbacks. But when at long last Lincoln was brought to realize the stern fighting quality of this bowed, heavy-featured man, with the rumpled uniform and untidy hair, the fate of the Confederacy was sealed. As the "dugout" George Washington had striven successfully to win his country's freedom, so the "retread" Ulysses S. Grant fought with equal success to preserve that country's union.

World War I

On the Allies' side there were few "retreads" to achieve fame or even notoriety in the war of 1914-18, although many ex-naval officers did admirable work—at considerable sacrifice of rank—in command of convoys. The Germans provided the best-known "dugout" when, early in the campaign, a serious threat developed on their Eastern Front. Prittwitz, hitherto in command against the Russians, was recalled, and it was designed to replace him by a highly promising officer named Erich von Ludendorff. However, Ludendorff was of no greater standing than major general, and the rules of seniority demanded

that someone of superior rank should be given the command, with Ludendorff assigned to him as chief of staff. The choice fell on Paul von Beneckendorff und von Hindenburg. In his sixty-eighth year, for some time he had been living quietly in Hanover, where he had gone on relinquishing his last command—that of the IV Army Corps. It was characteristic of his abiding sense of duty that on receiving the official telegram, asking him when he could be ready to undertake an important task, Hindenburg at once wired back, "Am ready."

Whoever supplied the brains, there can be no question that Hindenburg and Ludendorff worked admirably as a team—as the crushing defeat of the Russians at Tannenberg and Allenstein bore eloquent witness. In East Prussia they at least had the intelligence to adopt the admirable plans already worked out by Hoffman, the brilliant staff officer attached to Hindenburg's predecessor. A man with a strong sense of responsibility, it was only with a reluctant yielding to the call of duty that he accepted the presidency of the postwar republican Germany. However, it must stand to his eternal credit that he always distrusted Hitler and did his utmost to keep "the Austrian Corporal" out of office.

World War II

Like the earlier conflict, the war of 1939-45 yielded few "dugouts" of particular note, although large numbers were recalled to duty. The Navy, as usual, made full use of the services of a horde of "retreads" both in shore establishments and convoys; the headquartership for the "Mulberry" harbors, for example, was under the command of Captain Christopher Petrie who for many years between the wars had been a farmer in South Africa.

In the same way a swarm of 1914-18 land and Air Force veterans clambered back into uniform to carry out those thankless base jobs that kept the man in the line in being, or filled the ranks of the sturdy Home Guard that sprang into existence overnight when Great Britain lay under threat of German invasion.

But easily the most spectacular "dugout" the conflict produced was the 78-year-old Admiral Sir Walter Cowan. Insinuating his way back into a service in which he had first seen action in 1895, by some mysterious means or other the admiral managed to get himself posted as liaison officer between the Royal Navy and the 18th (Indian) Cavalry, serving in the Western Desert. He dropped from admiral's rank to that of commander rather than lose the job. Regarded as something between a minor deity and a mascot by officers and men alike, Cowan accompanied the regiment in every one of its engagements, including the "Balaklava" charge against the German guns at El Mechili. At Bir Hachèim the admiral was alone in a carrier when a wave of hostile tanks killed or captured all the troops in his immediate vicinity. An enemy armored car, which stopped for its occupants to demand his surrender immediately was pelted with revolver shots, and the dauntless "retread" was only made prisoner when his weapon had been emptied.

Presumably his captors were of the opinion that there was little further trouble to be expected from a prisoner who had well passed his seventieth year, for nine months later the little admiral was exchanged. As speedily as possible Sir Walter made his way out to Italy where he spent the rest of the war with the Commandos operating in and around the Adriatic. It is a revelation of the amazing length of his service to note that in 1944 Admiral Cowan was awarded a bar to the Distinguished Service Order he had gained in the Nile Expedition of 1898. The reward that was dearest to his heart, however, was his appointment as honorary colonel of King Edward VII's Own Cav-

alry, a unique honor linking him imperishably with the cherished regiment with which he had spent so many memorable days in the Western Desert.

Conclusion

From a strictly worldly point of view, few inducements are dangled before the "dugout" to encourage him to clamber back into uniform. In all cases it means a complete disruption of the civilian way of life he has built for himself, while in many instances it entails heavy pecuniary sacrifice. Moreover, the welcome that awaits him from those serving on a regular engagement rarely is more than lukewarm. It is felt that he was given his chance in the past, and his rivalry for any "plums" is apt to be resented. So long as he is content with "the crumbs that fall from the rich man's table" he is tolerated, but woe betide him should he venture to compete for more substantial fare.

Even in the obscure and humdrum job that usually is assigned to him he is not immune from criticism. It is jealously remarked that he is rather prone to "chuck his medals at you," and almost inevitably he is thought to be far too set in his ways. Equally, his juniors get almighty tired of the pained and weary look that comes over his face as he patiently draws attention to the insurmountable flaws in the brilliant schemes they have so confidently put forward. And unquestionably he can be infernally pernickety about small and apparently pointless matters of detail whose significance the aforesaid juniors have so far failed to grasp.

But at the back of it all the overriding fact remains that he *has* been shot over, and that full and by he does possess the know-how. However grudgingly it may be recognized, there is no escaping the fact that "there's life in the old dog yet."

Tradition is good. The nation needs men of tradition. In fact, we always need all the honorable men we can find. We need them to apply changeless principles to ever-changing problems of the times. Especially do we need them as long as mankind is challenged by so dangerous a threat to its freedom.

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It is too often accepted that "readiness" implies mere willingness to respond to a call to the colors. In that sense nearly every able-bodied man may be said to be ready to respond to his country's call in its day of peril. But the readiness of which I speak is more than willingness to answer the call.

Readiness is the product of knowledge, and knowledge is but another name for knowing how. It is training, and training is practice, and practice, and then more practice. It is also being well-equipped and well-supplied. In other words, readiness is the ability to do your job when, where, and if called upon. Such ability is essential for both military life and civilian life.

Admiral Arthur Radford

THE PIED PIPER OF MODERN MILITARY THOUGHT

Master Sergeant Forrest K. Kleinman, *United States Army*
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DESPITE the solemn warning of scientists, soldiers, and statesmen that an unlimited war would destroy civilization, the leading nations of the world are placing ever-increasing reliance for defense upon weapons of unlimitable force. With unconscious irony, this is called "national security."

At this very moment bombers are aloft over the Arctic Circle and the United States ready to strike devastating blows at virtually every major population center of the world upon an instant's notice. If they are unleashed with nuclear weapons, Arnold Toynbee suggests that the African Pygmy is the most likely member of the human race to survive the holocaust. Another observer of the current scene has nominated the oyster-boring seaworm as the highest form of life that could exist on a planet contaminated with radiation resulting from an unlimited nuclear war.

Bewildered and dismayed, thoughtful men are asking:

How did we arrive at the brink of this insanity?

In response, some members of the military profession are quick to point out that the atom and hydrogen bombs are the product of the scientific—not the military—mind. The implication is that science alone has triggered the catastrophe of unlimited war. This argument is as illogical as it is sterile.

War is an *art*—not a science—and all art is *selective* in the employment of means to achieve a purpose. Science can only give us means of waging war, it cannot determine their use. Science cannot formulate a purpose nor coordinate means to a desired end.

As Will Durant said in the introduction to his popular work, *The Story of Philosophy*:

Science tells us how to kill and how to heal . . . but only wisdom—desire coordinated in the light of all human experience—can tell us when to heal and when to kill!

It is not the weapons of war provided by science that menace humanity today; it is the idea of using *any weapon* without moral limitation. This view has been reflected in the public statements of some of the most profound military thinkers of our time—including Air Marshal Sir John Slessor, Generals Matthew B. Ridgway, Maxwell Taylor, and Major General William F. Dean. Recently, it was heavily underscored by General Willard G. Wyman, Commanding General, Continental Army Command, in an address before the Society of the 1st Division in Boston:

It is time for us to reexamine the military philosophy that has piped our footsteps so near the other side of the mountain from which mankind may never return. We must heed with the heart as well as the mind

Without the sanity of moral law even in war, mankind would have been reduced to a nonentity long ago. It could have been done just as surely with stones, clubs, and swords, and more quickly, just as cheaply, with chemicals and germs.

Unlimited War

The fact remains that "unlimited war" is accepted as a rational possibility in modern military thought. The expression appears frequently in staff studies, magazine articles, news analyses, public speeches, and in everyday conversation between military men.

The semanticist may interpose the objection here that we really do not mean what we say by "unlimited war"—that our problem is merely semantical. But the "referents" already established by our actions are unmistakable. Not even Alfred Korzybski, the patriarch of general semantics, could question what we mean after what happened at Coventry, Rotterdam, Magdeburg, Hanover, Nagasaki, and Hiroshima—where hundreds of thousands of innocent women and children were exterminated without regard for moral law or military necessity. To this parenthetical indictment, more than one military man would add: "And without achieving a valid military objective."

The most conclusive evidence that we do mean what we say by "unlimited warfare," however, can be seen in the growing inclination of a defense policy among the leading nations of the Western World to rely upon the threat of mutual annihilation as the sole means for deterring any and every kind of armed aggression. So pronounced is this inclination, that the United States lacked sufficient Army divisions with their capacity for limited warfare to prevent the Communist conquest of northern Indochina by limited aggression.

More recently, England and France scarcely could muster sufficient instruments of selective military force to implement their decision to intervene in the conflict between Egypt and Israel. Lacking the overwhelming might in conventional arms to achieve a speedy decision, the Anglo-French forces failed to present the world with the *fait accompli* intended and the affair ended in fiasco—another humiliating defeat for the West.

Despite the expert testimony of Lieutenant General James M. Gavin before Congress that a war with airborne nuclear weapons would produce immediate casualties by the *hundreds of millions on both sides* of the Iron Curtain, the United States and allied nations are continuing to reduce all other elements in the armament of the free world. Unless one finds it possible to believe that our leaders would gamble our freedom on a *bluff*, it is difficult to avoid the conclusion that we are on the verge of abrogating the age-old moral law which limits the destructive force of war for the preservation of the human race. Unless one finds it possible to believe that the dynamic movement of militant communism suddenly will abrogate the law of inertia and halt of its own accord, it is equally difficult to avoid the conclusion that unlimited war in this century is probable, if not imminent.

In the light of such somber conclusions as these, it should be obvious that it is

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high time to reexamine the military philosophy that has piped our footsteps so near the other side of the mountain from which mankind may never return. A lucid examination of our war philosophy will reveal more truth than paraphrase in this analogy to the Pied Piper of Hamelin. Because truth often speaks in words too familiar for the brain to understand, however, we must heed with the heart as well as the mind.

At this point, devotees of strategic airpower may assume that a parochial attack is about to be launched upon General Giulio Douhet and his American disciple General Billy Mitchell. On the contrary, it is contended that the Italian advocate of massive airborne attrition and the so-called martyr of strategic airpower in this country merely directed attention to the capability of a new vehicle for approaching more nearly the philosophic ideal of the true pied piper of modern military thought.

His name is so sanctified by military reverence of his facile pen that there is a reluctance to mention it for fear of inviting the ridicule of more learned and distinguished contemporaries in the profession of arms. But there are telltale clues aplenty in these ironic paradoxes.

His philosophy of war is accepted as dogma by some of the most eloquent critics of the one-shot, massive retaliation, mutual annihilation concept of national security. He is touted as: "The man whose thinking has dominated 20th century warfare." The forewords to the first American edition of his masterpiece were written with warm admiration by a sterling soldier and a renowned scholar—neither of whom, we may be sure, ever imagined that the first fruit of his philosophy of war in America would bloom like a toadstool over Hiroshima.

Before attempting to indict a philosopher whose reputation is so firmly ensconced in the military mind, let us consider some less popular suspects in the gallery of history. At once the names of Heraclitus and Nietzsche occur to the layman, for they were philosophers who conceived of war as *creative*—as a selective factor in the evolution of man.

It was Heraclitus who said:

War is the king and the father of all. And some he makes Gods and some men; some slaves and some free.

It was Nietzsche who said:

I love those who do not seek beyond the stars for a reason to perish and be sacrificed, but who sacrifice themselves to earth in order that earth may some day become superman's. . . . A good war hallows any cause. . . . When the instincts of a society ultimately make it give up war and conquest, it is decadent.

On the basis of this evidence alone, it might be concluded that here is not one, but *two* evil mentors of military thought. Upon sober reflection, however, it should be apparent that a philosophy which holds that war is *creative* is incompatible with a philosophy which conceives war to be an act of unlimited violence. As evinced by the etymology of the word itself, *restraint* is as essential to the creative process as force.

If all those who have held that war contributes to the evolution of man were indicted, it would be necessary to add to the list many more of the great thinkers of recorded history—including our own beloved man of the people, Thomas Jefferson. It was he who wrote:

The tree of human liberty must be nourished from time to time by the blood of martyrs and patriots. It is its natural manure.

But never—not even in the most controversial writings of any of these philosophers—will be found the thought expressed that restricting the violence of war is an "absurdity."

On the other hand, the great thinkers of the antithetical school of philosophy which holds that all war is evil can be eliminated from consideration. If modern military thought had been piped to their tune, the conflict in Korea could have been settled by a chess game.

Turning to the Orient, it is apparent that excessive restraint—like excessive force—can be suicidal for the society which adopts it in practicing the art of war. It was restraint, practiced to excess in paradoxical contradiction of the creative balance symbolized by Yang and Yin, that led the people of China to the brink of senility. So formalized and restrained had the art of war become since the days of Genghis Khan, that the nation that first invented gunpowder and the ironclad battleship was powerless to cope with the barbarians from the Western World a few centuries later. On one occasion, an indignant Chinese general presented a formal protest to a British commander because his troops had enveloped his army's flank in flagrant violation of oriental military tradition.

Historic Examples

A study of the oriental philosophy of war will show that there are *two* roads to the other side of the mountain, but fails to reveal the piper who has led us so far on the road we are now traveling. Certainly, it could not be Sun Tzu who five centuries before Christ wrote: "*The first principle of war is the moral law.*" While sometimes violated in practice, it was not until Prussian militarism captured the minds of men 2,300 years later that Sun Tzu's first principle was abandoned as a rational ideal in the oriental philosophy of war.

On definitive grounds alone, there is a temptation to give equally short shrift in this discussion to the great captains of history. Men like Alexander, Hannibal, Napoleon, Grant, and Lee were *artists*, not philosophers of war. The distinction is etched by a sentence of Durant's: "Every science begins as philosophy and ends as art; arising in hypothesis and flowing into achievement."

Some great captains like Julius Caesar and Grant have reported to posterity upon the reasons for their decisions and the efficiency of the means of war that they selected from those available, but such recording is after the fact. Rarely in their writings does one find an original philosophical concept—a hypothesis unexplored by experience. Nevertheless, they cannot be excluded from consideration, for their feats of arms alone have exercised a profound influence upon the evolution of warfare. If, for instance, there could be uncovered a progressive trend among military men of genius to employ less and less restraint in waging war, there might be reason to suspect that the concept of no restraint is the spontaneous product of an evolutionary process in military thought.

Instead, restraint appears as a characteristic of their conduct of war. For example:

> After defeating the Persians on the battlefield, Alexander integrated his defeated foes into his armies (an act of restraint the Soviet Union may be grateful that Hitler would not permit his generals to apply 2,265 years later in the Ukraine). Instead of killing the women of the enemy, Alexander held a mass wedding of 100,000 of Persia's fairest with 100,000 of his Greek veterans.
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> Although Hannibal campaigned the length and breadth of Rome's heartland for 15 years, his acts of force were directed against the soldiers of the enemy. No instance of wanton slaughter of noncombatants is recorded against his name as it is against that of his less talented opponents.
>
> Napoleon revived violent and decisive action on the battlefield but never

the artless carnage of Attila and Tamerlane whose words and works vanished from the earth with their dying breaths. The little Corsican's treatment of noncombatants was far more in keeping with the spirit of the Geneva Convention than that of many of its signatories in World War II —although it cannot be denied that his humiliating treaties and the chronic looting by his citizen-soldiers bred a desire for revenge that contributed to his final downfall.

Our own General Grant, who has been slandered as the "butcher" of the Civil War, brought a dogged determination to the Union cause that shortened the fraticidal struggle by some of the most violent battles of history, but no woman or child ever died by his orders. It was Grant's famous restraint clause in the terms of surrender at Appomattox that prevented the bloodthirsty politicians from later filling the gallows with Confederate officers. Even General Sherman, whose march through Georgia still lives in infamy in some backwaters of the South, gave such magnanimous terms of surrender to General Johnston that Congress disavowed them.

The Pied Piper

There is, of course, a very valid objection to attributing the *origin* of the concept of unlimited war to any individual. It has been aptly said that a philosophic theory is not an accident or whim, but an *exponent* of its age determined by antecedents and environments, and passing the results on to the future. Nevertheless, the "handing on to the future" is accomplished by means of *words*—the only vehicle for communicating thought yet developed by man for common use. In our case, here are the fateful words by which it was done:

No moral force exists apart from the conception of a state and law. . . . Never in the philosophy of war itself can we introduce a modifying principle without committing an absurdity. . . . War is an act of force, and to the application of that force there is no limit.

By a coincidence as significant as the words themselves, they were written at the same time that Mary Shelley penned her prophetic warning to the 20th century—*Frankenstein*. Someday, if the gift of laughter survives television and the human race survives nuclear fission, students of 30th century classrooms in anthropology may chuckle when their instructors tell them that adults of the 20th century heeded the philosophy of the piper, but thought the poetess wrote a penny thriller for children.

The man who piped the invitation to disaster was neither a great philosopher nor a great general. He was an ambition-ridden Prussian staff officer of Polish ancestry who was never permitted to command troops in combat. So brilliantly expressed were his comprehensive observations and opinions on strategy, tactics, and techniques, however, that his work *On War* was posthumously adopted as the military bible of the Prussian Army. His name was Karl von Clausewitz.

War is an act of force and to the application of that force there is no limit.

Those who have been quoting Clausewitz without reading him may bring the accusation that his words are taken from the context of his meaning. On the contrary, this is the *text* of his philosophy of war. With this hypothesis as a radial rod, he established the *direction* of his own and his readers' thoughts on war. It appears in the opening pages of his first chapter—"the only one," Clausewitz later wrote in his notes, "which I regard as finished. It will, at any rate, serve to give the whole the direction which I wished to maintain throughout."

Impact on Germany

The direction in which it took Clausewitz' own nation was indicated by Dr. O. J. Matthijs Jolles in 1943 when he wrote:

There can be no doubt that this conception which regards war as an exercise of unrestrained force . . . has most strongly influenced the minds of the German nation and its military leaders.

Long before Douhet wrote and Mitchell exhorted, German Zeppelins were dropping bombs on noncombatants in the city of London. By 1940 the efficiency of the tools to achieve the ideal of unlimited war had improved to the point where the Nazi Air Force was able to obliterate the open city of Rotterdam in a single day.

Where it has taken the German nation to date is indicated by any current map of Europe. But the end of the road for those who were first to heed the pied piper is yet to be seen. The tools to achieve the Clausewitzian ideal are now so efficient that even a limited atomic war between East and West might do to the German people what the Nazi Air Force did to the citizens of Rotterdam. If this should happen, yet another national corpse will be added to the dozens cited by Arnold Toynbee in his monumental work, *A Study of History*, that demonstrates the penalty for violating the moral law in war.

While some might shed no tears on Germany's grave, it must be remembered that all the other military powers of the world long have been traveling on the same road, marching to the same piper's tune. Impressed by the initial successes scored by German arms in the last half of the 19th century, military men around the globe were quick to adopt German military methods. In the process, they also assimilated the philosophic concept of war which gave German military thought its direction.

The way in which Clausewitz' words were "handed on to the future" is authoritatively described by the following paragraph from Doctor Jolles' introduction in the first American edition of *On War*:

Famous military leaders and writers of Germany in those days, like Moltke, Von der Goltz, Von Blume, Meckel, and many others, declared themselves to be pupils of Clausewitz and said that Germany owed to him her success on the battlefield. As he had advised, many of them went to other countries to gather practical experience and to become instructors of foreign armies. With them Clausewitz' theories spread. Von der Goltz trained the Turkish General Staff, Meckel the Japanese, who largely credited him with their success in their war with Russia. When asked by the English Major Stewart L. Murray, who was preparing a book on Clausewitz, to state his opinion as to the importance of the great philosopher of war, Meckel answered: 'I, like every other German officer, have, consciously or unconsciously, instructed in the spirit of Clausewitz. I maintain that everyone who nowadays either makes or teaches war in a modern sense bases himself upon Clausewitz, even if he is not conscious of it.'

That Meckel's opinion is as true of our generation as it was of Meckel's is claimed by the American publisher of *On War*, in the following jacket synopsis:

Every general staff, every officer, every soldier and trainee, and every professional and amateur military expert turns to Clausewitz' work not only as a book of instruction but as the authority for the interpretation and prediction of the fortunes of war.

One of Clausewitz' most famous disciples was General Helmuth von Moltke whose system of Command and General Staff was adopted by every modern army, including our own. That brilliant military minds are not infallible, however, is demonstrated by Von Moltke's ridiculous description of the American Civil War: "A

struggle between two armed mobs from which nothing could be learned." It is not surprising that a theoretician who failed to recognize the implications to future warfare of Lee's use of field fortifications also failed to recognize the implications to the future of the Clausewitzian ideal.

Less obvious, but equally pertinent, is the contrast between Von Moltke's summation of the Civil War and that expressed poetically by Steven Vincent Benét in *John Brown's Body*. Some readers may find food for a philosophy as well as for thought in such inspired lines as: "He knew the uses of a hill. . . . We have made the sick earth tremble in our time in our time, but we have not learned to leave the grain standing in the fields."

Clausewitz hammered:

So, we repeat our statement, war is an act of force and to the application of that force there is no limit.

Throughout the remainder of his first chapter, which Clausewitz considered to be the compass for all that he had to say on the art of war, he attempted to modify the very concept which he previously said could not be modified without committing an "absurdity." He did this by describing what he thought was an elastic but impenetrable barrier between his ideal of unlimited force in the abstract and the achievement of its "perfection" in reality.

Clausewitz wrote:

Everything, however, assumes a different shape if we pass from the abstract world to that of reality. In the former everything had to remain subject to optimism and we had to conceive both one side and the other (opposing) as not merely striving toward perfection but also attaining it. Will this ever be so in practice? It would if:

1. war were a wholly isolated act, which arose quite suddenly and had no connection with the previous course of events,

2. if it consisted of a single decision or of several simultaneous decisions,

3. if its decision were complete in itself and the ensuing political situation were not already being taken into account and reacting upon it.

The underlying fallacy of this reasoning is apparent in Clausewitz' sanguine assumption that "everything assumes a different shape when we pass from the abstract world to that of reality." The history of civilization shows that the contrary is true. Every work of man begins with an abstract hypothesis and flows into achievement. It is by abstract ideas that man blueprints his future reality. A case in point is nuclear fission. Once it, too, was an abstract idea in the minds of philosophers and scientists, and many generations of men like Clausewitz were firmly convinced that nuclear fission could never be realized in the world of reality.

Clausewitz' Inconsistencies

Today, the terrible reality of nuclear fission has blasted a hole in Clausewitz' flimsy barrier to the achievement of his hypothesis. The hole is so large that all of mankind can pass through—providing we continue to move in the direction that Clausewitz has piped our unwitting footsteps. Whatever the previous course of events, unlimited war with thermonuclear weapons, delivered at speeds that long ago broke the sound barrier, *could* "consist of a single decision or several simultaneous decisions" in the capitols of the world. And the decision for our civilization *could* be "complete in itself."

Actually, Clausewitz' three "ifs" were as frail in logic when they were written as they are in fact today. The futility of relying upon political calculation of the odds of war as a modifying influence was already evident on every page of history. What of the religious wars? Did Clausewitz realize how near to his ideal Europe had already come with pikes and crude

muskets in the Thirty Years' War when Germany lost a third of her population?

Human error in interpreting events prior to war and in calculating the ensuing political situation has sent many a nation to the morgue. Consider the events leading to World War II, the political decisions of the United States, and the ensuing political situation.

That Clausewitz sensed the danger of his own hypothesis and the philosophical weakness of his modifications is suggested by a note that he wrote in 1827.

We must further expressly and exactly establish the point of view, no less necessary in practice, from which war is regarded as nothing but the continuation of state policy with other means. . . . *It must be fully explained in Book I and also contribute to revision of the first six Books. By such a revision the first six Books will be freed from many a piece of dross; many a fissure and gap will be closed.*

Unfortunately, Clausewitz failed to recognize and close the *big* gap in his philosophy of war. Apparently, it never occurred to him that war waged without restraint —without the limitation of moral law—is not *art*, but *murder* and punishable here on earth as shown by the historic fate of every nation that has set itself above the law.

His very use of the words "art" and "moral" reveals this gap in his thinking. Note the ironic contradiction in this sentence: "Philanthropic souls might easily imagine that there was an *artistic* way of disarming or overthrowing our adversary without too much bloodshed and that this was what the *art* of war should seek to achieve." His discussion of the "moral quantities" in war is confined exclusively to the psychological aspects which we call "morale." He was more confused than he knew when he debated with himself in print the question: Is war a science or an art?

Truly, Clausewitz' philosophy was an exponent of his age. It was an age of absolutism, pessimism, and cynicism—an age in which the gap between religion and science became a chasm that only now is beginning to be bridged in the thinking of men. So wide did the gap become during his lifetime that altars were actually built for the worship of science instead of God. The altars were soon relegated to limbo, but not the worship.

Of most immediate significance, it also was the age of Napoleon. To the tradition-bound armies of Europe, the decisive force that Napoleon reintroduced to the battlefield, the way he combined fire and movement was as startling as the flank envelopment was to the Chinese general mentioned earlier. To the young Prussian staff officer who was an eyewitness of the humiliating defeats that the German armies suffered at the hands of Napoleon, it may well have seemed that here was a genius who had discovered the ultimate secret of the art of war. Clausewitz spent the remainder of his life in search of that secret.

Perhaps, he arrived at his opening hypothesis by a thought process like this: "Napoleon produced more decisive force on the battlefield than the enemies he defeated. Therefore, the more forceful act of war is the more nearly perfect. Hence an act of force without limit is the perfection which military thought must strive to attain."

A similar thought process is evident in our national defense planning these days: If the bomb dropped on Hiroshima is an efficient weapon of war, then a bigger bomb is better, and the biggest is best. By applying the same type of reasoning to the diet of children, we could kill them all with milk.

To jibe his hypothesis with the final defeat and disaster that overtook Napoleon, Clausewitz theorized that the defensive form of war is superior to the offense. He emphasized, however, the importance

of the counterattack—"the flashing sword of vengeance," he called it. Secretary John Foster Dulles calls it "massive retaliation."

It is not the purpose here, however, to challenge the theories, observations, or conclusions that occurred to Clausewitz once he sounded the key for his piper's tune. No doubt there is much of real military value in the body of his work—although a critical rereading is recommended for all who still rely upon what they memorized in college or at the United States Military Academy. As Major General William F. Dean once remarked, "Perhaps too many of us read Clausewitz when we were too young to heed the heart."

Conclusion

There is no attempt here to propound a new philosophic hypothesis to replace the one that has piped us so far into the shadow of the mountain. We do not need a new refrain to march to; we only need the wisdom to obey the age-old refrain of moral law that harmonizes all life on earth.

Although military missiles have no eyes to determine the sex and age of their targets, surely in applying the art of war man can select his targets more artistically than is proposed by Clausewitz' 20th century disciples. General Douhet's theory that massive airborne destruction of a nation's populace—including women, children, and other noncombatants—can paralyze a nation's will to resist has proved as false in military practice from Madrid to Magdeburg as it is immoral. For any nation to rely predominantly upon such a theory in defense planning would be military weakness. For the United States as "a Nation under God" to do so, would be madness.

While we must retain our strategic nuclear capability as insurance against coercion by the Communist pawn players, we must not deprive our Defense Establishment of selective means for dealing effectively with limited aggression. We must be better prepared than our enemies to limit the application of force to the battle area and win. Moreover, we must be as willing to tithe our sons in defense of human liberty as were our forefathers in all the wars that have kept our Nation vigorously alive since 1775.

It is true, of course, that a balanced Defense Establishment which can meet these requirements will cost money—more, probably, than is now being allocated by our defense budget. If the American people are not willing to pay the price of real national security in money, however, the story of the Pied Piper of Hamelin suggests a final analogy: Because the parents of Hamelin were unwilling to pay the price in money for securing their city from the danger of rats, they lost *all* of their children.

Readers who believe that the creation and evolution of the symbols we call "words" has not been governed entirely by idle chance may find the etymology of the name Clausewitz, itself, interesting. In old German, as in Latin, *clause* meant "close or ending," and *witz* meant "joker" —a character depicted on playing cards by a *death's head*. But no interest in symbolic logic is necessary to appreciate the crowning irony of his life:

The pied piper of modern military thought—*Herr* Karl von Clausewitz—died in 1831 of a ratborne disease.

MOVING?

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Picture Transmitter

A facsimile set that will flash a picture from one spot to another within five minutes after the original photograph was taken has been developed for field use. The system consists of a Polaroid camera which takes the picture and develops it automatically, and a facsimile device which

US Army Photograph

Jeep-mounted facsimile set

fits easily into the back of a radio-equipped jeep or car. Using standard military radio equipment, the picture can be picked up by a companion receiver as much as 40 miles away. The set also can send a photo thousands of miles over standard telephone lines, or even greater distances using long-range radio circuits. It can be mounted in a light reconnaissance plane or helicopter, permitting an aerial photographer to send surveillance pictures continually to command headquarters direct from the aircraft.—Official release.

Aerial Tanker Tests

A *KB-50J* aerial tanker successfully lifted a record weight of 178,000 pounds in special load flight tests. This load is 2½ tons greater than the maximum weight previously lifted by this type aircraft. The big four-motor tanker, which is normally propeller driven, utilizes an additional 12,000 pounds of thrust from two *J-47* jet engines to increase its speed, altitude, and fuel carrying capacity.—Official release.

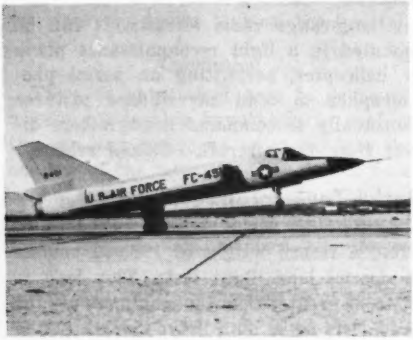
Conversion Kit

The *Super T-6*, a modified version of the *T-6 Texan* trainer, has a cruising speed of 216 miles an hour, an increased rate of climb, and a range 20 percent greater than older models of this aircraft. Modifications include a tricycle landing gear and a new type canopy. The wings have been shortened by four feet, and wingtip tanks have been added. The conversion has been developed in kit form to enable the 32 countries now using the *T-6* to modernize their planes.—News item.

All-Weather Interceptors

Said to be the world's fastest all-weather interceptor, the *F-106A Delta Dart* is now in production and is undergoing flight tests. The fuselage of the *Dart* is over 70 feet long, and has the Coke-bottle configuration of the area rule design used in the *F-102A Delta Dagger* to which it bears a strong family resemblance.

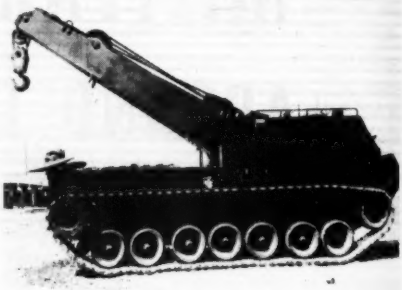
Another all-weather fighter aircraft now under development and scheduled for delivery to the Navy in 1960 is designed to exceed twice the speed of sound. As yet unnamed, the radar-equipped fighter will be powered by a 15,000-pound thrust *J-75* turbojet with afterburner, and will operate at extreme altitudes. It will incorporate many of the characteristics of the currently operational *F8U-1 Crusader*, but is of completely reengineered design. It has been described as having a swept wing mounted high on the fuselage and well back of the cockpit section. A sharp pointed nose containing radar gear fairs into the cockpit area with the airscoop well forward under the nose.—News item.



Speedy all-weather *F-106A Delta Dart*

Heavy Recovery Vehicle

The Army's *M51 Heavy Recovery Vehicle* weighs 60 tons, can attain a top speed of 40 miles an hour, and is capable of towing three tracked vehicles totaling up to 172 tons in weight simultaneously. The *M51* has five separate hydraulic systems for boom and winch operations which

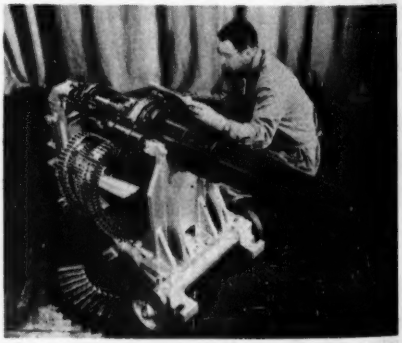


M51 Heavy Recovery Vehicle

are operated from within its armored cab. The versatile vehicle is armed with an antiaircraft machinegun and a rocket launcher, and is equipped with a smoke projector so that it can provide its own smokescreen.—News item.

More Powerful Weapon

The 30-mm version of the *Vulcan* rapid-firing cannon shoots a projectile with three times the explosive power of the earlier 20-mm model. Both types of the



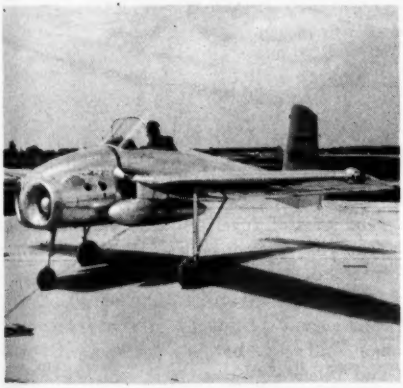
Official US Air Force Photograph

30-mm version of the *Vulcan*

Vulcan weigh about 300 pounds. The 20-mm weapon is carried by the *F-104 Starfighter* as primary armament. It is mounted on the left side of the fuselage of the *Starfighter* just below and behind the cockpit. A seven million-dollar contract for the production of the 20-mm *Vulcan* has been announced. Official information concerning the rate of fire and the fire control system of the *Vulcan* weapons has not been released.—News item.

VTOL Jet Flight Tested

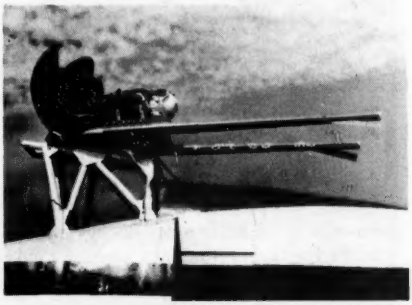
The experimental *X-14* vertical takeoff and landing (VTOL) aircraft has completed initial flight tests successfully. Powered by two British-made jet engines, the *X-14* is designed to remain in a conventionally horizontal position while making a vertical takeoff or landing as well as in forward flight. Thrust diverters or vanes located behind the engines direct the powerful jet blast toward the ground to lift the plane into the air. For forward flight the pilot redirects the thrust toward the rear of the airplane. Because normal control surfaces such as elevators, rudder, and ailerons have no effect during hovering and at slow forward speeds, the aircraft is equipped with compressed air nozzles at wingtips and tail to provide necessary directional control. The *X-14* has a wingspan of 34 feet and is 25 feet long.—Official release.



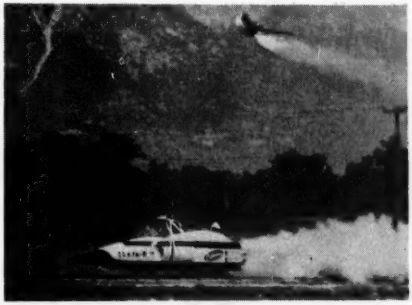
Jet-powered VTOL *X-14*

Ejection Seat Tests

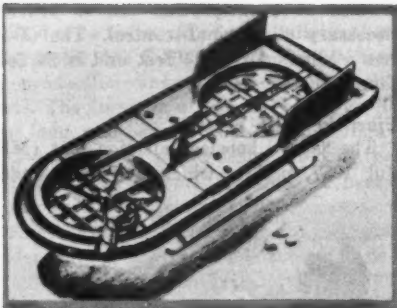
The "aerial bobsled" ejection seat (MR, Jul 1957, p 65), which has been under test for use in supersonic aircraft, is now equipped with two 5-foot-long booms to prevent tumbling in flight. The booms are equipped with folding fins to increase the seat's stability in its rocket-propelled trajectory away from the *F-102A* cockpit mounted on the testing sled. The rocket test track ends near the edge of a mesa, and in tests the ejection seat is projected over the end of the tract and parachuted to the canyon floor 1,500 feet below.—Commercial release.

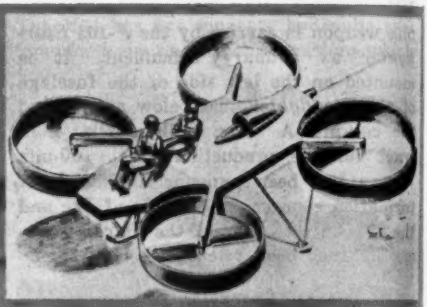


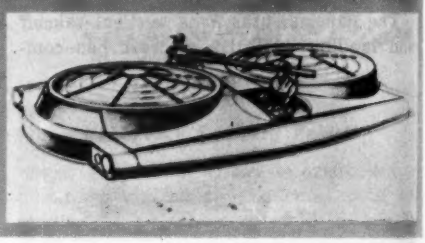
Boom-equipped ejection seat



Ejection seat is rocket propelled







Aerial Jeeps

The Army has ordered six prototype duct-fan rotorcraft, two each of the three types pictured. Contracts in the amount of 1.5 million dollars have been made for the preliminary design, wind tunnel testing, construction, and flight testing of the unique aircraft.—Official release.

Utility Transport

The *JetStar*, a 10-passenger, multipurpose jet utility transport plane, was designed and a prototype built in only 30 weeks. The 500-mile-an-hour airplane is powered by two *Bristol Orpheus* jet engines mounted in pods attached to the rear of the fuselage. The fast transport features 53-foot-long swept-back wings, and will have a normal cruise range of 1,700 miles at an altitude of 40,000 feet. The second prototype of the *JetStar* will use four *J-83* or *J-85* engines.—Commercial release.

***JetStar* utility transport**

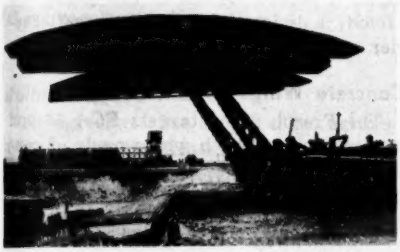
More Warships Deactivated

The Navy has announced plans to take an additional 22 war vessels out of active service by 30 June 1958. This action brings to 94 the total number of vessels the Navy plans to put in mothballs to reduce expenses. The 72 vessels covered by previous announcements included warships of all types.

The latest list of vessels for deactivation includes the heavy cruiser *Albany*, the submarine *Balao*, the attack cargo ship *Virgo*, the high-speed transport *Carpellotti*, eight mine hunters and minesweepers, and 10 destroyer type vessels. —News item.

GREAT BRITAIN

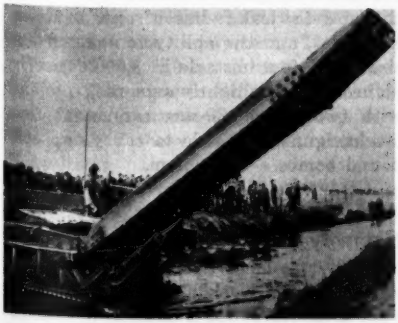
Combat Bridging Equipment



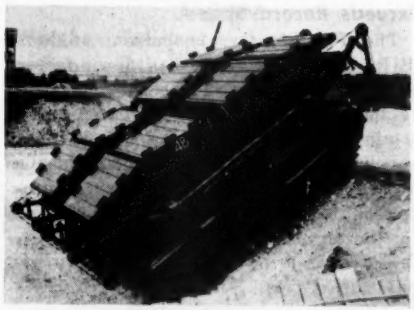
Copyright United Press Photograph

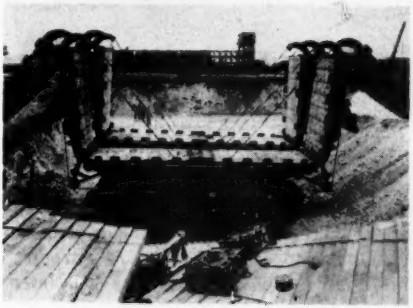
British *Centurion Bridge Layer*

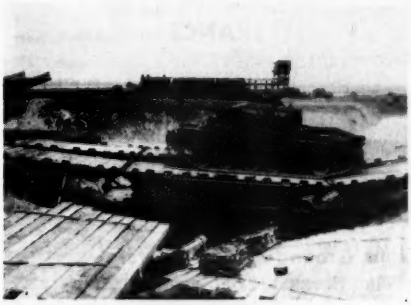
United States tank-mounted scissors bridge



US *SPAB* self-propelled assault bridge







Copyright United Press Photographs

British *Linked-Ark* folding assault bridge

Of the bridging devices shown only the British *Centurion Bridge Layer*, which is capable of sustaining the weight of the heaviest British and United States armored vehicles, is currently operational. All others are still in experimental development.—News item.

Exceeds Record Speed

The *P.1 Planform* supersonic fighter (MR, Sep 1956, p 73) has flown faster than the official world speed record held by the *Delta-2*, although the exact speed attained by the swept-wing *P.1* was not announced. The *P.1* is a day and night all-weather interceptor which is now in production for the Royal Air Force. Power for the production models of this aircraft, the *P.1B*, is provided by two *Avon* turbojets with reheat. Its armament consists of 30-mm cannon and guided missiles.—News item.

Mixed-Power Fighter

Development of the *Saro 177* mixed-power fighter as a replacement for the *SR-53* will be continued in spite of the current British plan to replace manned fighter aircraft gradually with guided missiles. The new aircraft will be built for the British Navy. It is to be powered by a combination of the *Gyron, Jr.* turbojet engine and the *Spectre* rocket.—News item.

FRANCE

Armament Modification

The French destroyers *Surcouf, Chevalier-Paul,* and *Dupetit-Thouars* have new 5-inch antiaircraft guns, the chambers of which have been designed to accommodate United States Navy 5-inch ammunition.—News item.

Light Ground-Attack Fighter

The Breguet *1100* ground attack and tactical light fighter is now in the flying prototype stage of development. The light fighter has two *Turbomeca Gabizo* jet engines mounted side by side. The engine air intakes are located in front of and above the roots of the swept-back wings, and the jet exhausts are located in the tail of the plane. The *Gabizo* engines with afterburner and reheat develop 3,300 pounds thrust each. The *1100* weighs nearly seven tons, and was flown faster than the speed of sound in its first test flight. A second version of this plane, the *1100M*, is designed for naval aircraft carrier operation.—News item.

Concrete Wings

The French flying targets *ECA 56* and *57* are equipped with wings made of concrete reinforced with prestressed steel cables. *ECA 56* has a flat fuselage of honeycomb construction and can be towed at speeds up to Mach 0.8. *ECA 57* is a free-gliding target. Both designs are gyro-stabilized in flight.—News item.

NATO

Ground Support Aircraft

The North Atlantic Treaty Organization is conducting tests with a view toward selecting a lightweight, subsonic fighter of simple design and short range with the specific capability of furnishing low-level support to ground force action. Experimental models of three aircraft, the French Breguet *Taon*, the Dassault *Etendard*, and the Italian Fiat *G-91*, have been ordered for NATO tests. All of these aircraft are powered by the *Bristol Orpheus* lightweight turbojet engine. NATO specifications for the aircraft stipulated that the new strike-fighter need not operate above 5,000 feet or faster than Mach .95 (about 700 miles an hour). Specifications also included a tactical radius of approximately 170 miles, and the ability to take off and clear a 50-foot obstacle in 3,000 feet. The planes are to be lightly armored, equipped with two 20- or 30-mm cannon or four machineguns, and able to carry two 500-pound bombs.—News item.

TIBET

Highway Opened

A 700-mile-long highway, said to be the highest in the world, is reported to have been opened between Ghargalik in western Sinkiang province of China and Gartok

in western Tibet. Most of the highway is at an elevation of more than two miles. At its highest point it is over 18,000 feet above sea level.—News item.

CANADA

Joint Defense Plans

An agreement has been reached between Canada and the United States on the integration of the air defenses of the two nations. The agreement includes the setting up of a system of operational control of the air defense forces of the continental United States, Canada, and Alaska under an integrated headquarters responsible to the Chiefs of Staff of both countries. The formal statement which announced the historic act stated that the new headquarters would work out joint plans and procedures to be ready for use in case of emergency. This bilateral arrangement extends the mutual security objectives of the North Atlantic Treaty Organization to the air defense of the Canada-United States region.—Official release.

BELGIUM

Nonmagnetic Minesweepers

Two nonmagnetic minesweepers, the *MSO-515* and *516*, built under the Mutual Defense Assistance Program have been received by the Belgian Navy and given the names of *Truffaut (M.908)* and *Bovesse (M.909)*. These vessels have wooden hulls and nonmagnetic equipment. The diesel engines of the 750-ton minesweepers are made of nonmagnetic stainless steel alloy and drive controllable-pitch propellers. Top speed of the vessels is 15.5 knots.—News item.

USSR

Helicopter Tested

Initial flight tests of the *Ka-18*, a four-place coaxial helicopter which is a development of the two-seat *Ka-15*, have been completed.—News item.

JAPAN

Weather Balloons

Giant weather balloons 40 feet in diameter and carrying a 675-pound load are in use by United States Navy weather experts in Japan to collect meteorological data over the Pacific Ocean. The big balloons, equipped with radios that automatically transmit weather information, drift from west to east at an altitude of 30,000

Official US Navy Photograph
Giant meteorological balloon

feet, and are designed to travel all the way from Japan to the North American Continent and on to Europe, if desired. To prevent damage to populated areas, each balloon carries a timing device which can be preset to destroy the drifting weather station over open water. The balloons travel high above regular air routes and are rigged to destroy themselves if they drop to an altitude of 28,000 feet.—News item.

POLAND

Atomic War Games

The Polish Army has participated in the first atomic maneuvers to be announced from behind the Iron Curtain. The war games took place in the northern Pomeranian province of Stettin. In this maneuver an atomic weapon was simulated by a 330-pound TNT explosion. In addition, live shells, rockets, and bombs are said to have been used. The attacking force of the war games was a reinforced mechanized infantry regiment supported by a rocket artillery battery and a squadron of aircraft.—News item.

Airborne Border Patrol

The Polish Frontier Guard Service is employing *CSS-13* aircraft and *SM-1* helicopters in patrol duties on land borders as well as over the border which fronts the Baltic Sea. The *CSS-13* is the Polish-built version of the Soviet *PO-2*. It is a two-seat light communications and training biplane which has been in service with the Soviet Air Force since 1927. The *SM-1* helicopter is the Polish-built version of the Soviet *Mi-1 Hare*.—News item.

ALGERIA

Missile Test Center

The French Joint Services Missile Test Center is located in the Guir Desert near the town of Colomb-Béchar, 180 miles south of Oran. The main launching area for long-range missiles, which is about 65 miles to the southwest of the headquarters, has an impact area that stretches for 600 miles to the south and almost 1,200 miles in a southeasterly direction. Missiles tested here include the *SE-4200*, a ramjet-propelled, ramp-launched surface-to-surface missile with a reported range of 60 miles; the antiaircraft *PARCA*, a ramp-launched, beam-rider surface-to-air missile now in production; and the *S.S.10* and *S.S.11* missiles, which have both air-to-surface and surface-to-surface capabilities. The *S.S.10* (MR, Oct 1956, p 72) is now in service with the French Army. The *S.S.11* is a two-stage, longer-range antitank missile, developed from the *S.S.10* that is in use by the French Army and Air Force.—News item.

TURKEY

Warships Received

Arrangements have been completed for the transfer to Turkey of four 2,840-ton *Milne* class destroyers of the British Navy. The four vessels, the *Milne*, *Marne*, *Matchless*, and *Meteor*, are to be completely reequipped before delivery in 1958. Weapons of the *Milne* class include six 4.7-inch, one 4-inch, four 2-pounder, and ten 20-mm antiaircraft guns, and eight 21-inch torpedo tubes. They were designed for 36 knots top speed. Turkey also was scheduled to receive 10 destroyers and minesweepers from Canada during 1957.—News item.

NATIONALIST CHINA

Armed Forces Display

In a parade on Taiwan, marking the 46th anniversary of the revolution that led to the overthrow of the Manchu dynasty, a fully equipped armored division passed in review and United States *F9F*, *B-47*, and *F-100* aircraft joined nearly 150 Nationalist Chinese Air Force jets in an aerial demonstration. Nationalist Chinese armed forces are reported to be at a strength of approximately 600,000.—News item.

CZECHOSLOVAKIA

Aircraft Manufacture

The Czechoslovakian aircraft industry has completed production of the *MiG-15* and *17*, and will produce the twin-jet *MiG-19 Farmer*. The *Farmer* is reported to weigh about 10 tons, and have a maximum level flight speed of 900 miles an hour.—News item.

FOREIGN MILITARY DIGESTS

Order or Anarchy Under the Atomic Umbrella?

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel A. Green in the "Australian Army Journal" February 1957.

THE first nuclear attack on Hiroshima in 1945 brought an apparent instantaneous enlightenment to military thinkers. Here, in one device, was the ultimate simplification; destruction in the most concentrated and shattering form.

After 140 years of progress in the art and science of war during which the division had grown into a complicated serpent 100 miles long or a tortoise 10 miles broad, depending on whether it was in movement or deployed, the physicists had produced one single effective answer to the intricate conventional organisms of warfare in all three elements.

Adherents of the strategic bombing school of thought probably were the most gratified, professionally, by the emergence of the new weapon. Proponents of the Douhet doctrine—the belief that war should be waged directly upon the focus of modern life, the city—had hitherto been frustrated during the five years of World War II by a series of indeterminate results.

They had argued, logically, that as our modern mechanical and industrial civilization derives its main human and material resources for the prosecution of war from the great urban centers of population and the adjacent factories, the shortcut to victory lay in direct attack upon the moral and material heart of the enemy—his cities.

Large-scale trials upon London, Coventry, Hamburg, Berlin, Leningrad, and Tokyo still were inconclusive. Despite great structural damage these populations continued to work and produce, and their armies remained intact. Soldiers and sailors were able to contend that bomber attacks were better directed to selected strategic targets such as oil stocks or railways, or even to troop concentrations in the field, as was done at Caen.

Since one of the major preoccupations of philosophers and scientists is the progress toward rationalization or simplification, this diversion of the long-range heavy bomber against subordinate targets represented a partial failure to the pure airpower school, and postponed the emergence of air forces as the dominant forces in war.

The possession of the nuclear weapon by the Allies accomplished the final phase of this military revolution. The mode of its employment immediately and strategically against Japanese cities, and the prompt capitulation of Japan is the clearest evidence of that fact. Therefore, since 1945 the continued existence of city civilizations has been first, conditional upon the possession of nuclear weapons by one great and benevolent power, and later the nuclear stalemate, since both the United States and Russia have possessed stocks of these weapons.

The Nuclear Terrain

It has taken 10 years of fluctuating postwar policies and strategy to formulate the pattern of war in the so-called atomic age. Unfortunately, the conclusions derived from this experience are not all of that crystal clarity which the strategist would desire.

One simple and indisputable factor, however, has come to be accepted. The nuclear weapon in both its strategic and tactical effects is more topographical than operational. It inhibits the growth and threatens the existence of urban communities, and, although so far tactically untried in the field, it has the power to disperse and canalize land and sea forces just as effectively as mountains or archipelagoes did in the past.

Moreover, the exertion of these effects is no mere passing phase of opportunity as with conventional weapons. By its nature it is as permanent as geography itself. The powers, major or minor, have not as yet wholly and fully adapted themselves to this factor, hence much of the current confusion and flux in military and political thought. Statesmen and nations keep trying to avoid the dominant effects of nuclear weapons and are constantly forced to revert to a position of subordination to them. They cannot be used but they cannot be ignored.

Relative Vulnerability

The chances of nuclear warfare supervening, and of subsequent survival appear to depend broadly on two main factors: the quantity of weapons and their means of delivery possessed by the major powers, and, reciprocally, the suitability of their respective target systems for nuclear destruction. It is almost certain that there are only three nations presently in possession of the weapons—the United States, Russia, and Great Britain. The United States probably has all the nuclear weapons she needs, Russia is dangerously well-stocked, while Britain apparently is producing appreciable numbers of the weapons. It is also public knowledge that all three powers possess the thermonuclear weapon or hydrogen bomb, a purely strategic weapon of enormous potential. Judged from this positive angle, the United States has a real but probably diminishing lead and superiority in weapons and means of delivery.

In relative vulnerability the situation is quite different. Great Britain, with her concentrated population and industry in proximity to the European mainland, is by far the most vulnerable. America, with her great metropolitan centers in the northeast, also presents appreciable targets, but at longer ranges and over a greater area. Russia is most favored with well-dispersed industries and installations located on a great land mass. This factor considerably offsets any inferiority in Russian weapon stocks, and reduces the practicability of British participation in nuclear warfare to the degree of suicide.

Those nations which do not possess nuclear weapons are faced with a thorny dilemma. They may align themselves with one of the major protagonists, and risk committal to nuclear reprisal in the event of full-scale war, or seek a precarious neutrality which still cannot guarantee them immunity from war if their strategic position attracts belligerent interest. This is

fundamentally the choice which lies before Australia, India, Indonesia, New Zealand, and all the other nonnuclear powers.

The Nuclear Climate

The first use of nuclear weapons was justified by the argument that it shortened the duration of hostilities and, in effect, prevented the sacrifice of the countless soldiers who would have been required to assault Japan. The decision was made in the simplest context, since the US alone possessed the weapon, although the Allies approved and in certain instances encouraged its employment.

The subsequent controversy as to whether the attack was necessary, since Japan probably was on the verge of surrender, is irrelevant, as the Allied intelligence interpretation of Japanese intentions could only be conjecture at that time. Nevertheless, the most potent counterargument, that of possible nuclear reprisal, was absent.

The reaction of the more radical Asian press was spontaneous and critical. The Indian contention was that the use of the weapon was unwarranted and that, furthermore, it had been employed in a discriminatory manner, since it was believed that the preponderantly Western Allies, who had atom-bombed an Asian people, would not have used the weapon against European nations, for example, Germany. This I believe to have been wholly erroneous, as both Germany and the Allies tried to develop the bomb in time to use it in Europe.

With the advent of the postwar struggle for world leadership between the United States and USSR, there arose new postulates for the formulation of future strategy. On our own democratic side of the fence we assumed that no democracy seeks to wage war; indeed, that was a proved article of faith during the Fascist aggressions of 1930-42. Our main apprehension now is that the expanding forces of world communism will use any and every weapon to further their bid for domination.

Against this theory stands the interesting hypothesis of Arnold Toynbee, the historian, that Communist Russia has a fanatical sense of inner rectitude similar to that of the early Christians, and that from this conviction there arises a fatalistic type of persecution mania which assumes that the non-Communists must inevitably attack Russia even as Hitler did. This, then, presupposes that Russian nuclear weapons would only be used in defense or retaliation—a somewhat specious and unreliable theory. In fact, when Truman and MacArthur disagreed over Korea the Americans obviously believed that Russian involvement there would lead to full-scale nuclear warfare.

Much has been said since World War II of the need to return to an objective assessment of war aims and the methods of waging war. Unlimited warfare and concepts such as unconditional surrender have led to wholesale destruction and loss to victor and vanquished alike. A return to the limited wars of the 18th century accordingly is demanded, in which destruction is limited to that degree of force needed to attain reasonable national aims and advantages.

The defensive ferocity of the democracies in World War II, in particular, has since been severely criticized. There also is a general plea to common Christian humanitarianism that nuclear warfare by unrestricted destruction can result only in the collapse of modern civilization and all its attendant material and cultural benefits.

This plea assumes the complete rationality and decency of human nature and omits all the contrary evidence from Genghis Khan to Herr Himmler.

History proves that the forces of the spirit and the emotions have constantly dominated those of intellect and even self-

interest, and that even a well-meaning, sentimental regard for the world we live in is undependable under the stress of national and personal conflict.

Thus much present discussion of nuclear warfare leads to that military *reductio ad absurdum* of massive retaliation. This doctrine recently has been debated during the American presidential elections and, in effect, also was voiced by Khrushchev in his sinister threat of nuclear retaliation made against France and Great Britain during the Suez crisis.

Massive retaliation entails the constant readiness of large stocks of thermonuclear and fission weapons and their associated delivery vehicles to discourage from the outset any potential aggressor. American opinion has been greatly exercised by the prospect of worldwide biological hazards arising as secondary effects from such operations, quite apart from primary destruction, and the defense scientists whose politics seemed to influence their technical advice have done little to resolve this problem.

Since both the major powers now clearly subscribe to this doctrine, as again witness the NATO assumption of nuclear warfare *à l'outrance* as a basic premise, the result is a varying but persistent state of political and military tension. This tension, however, has prohibited Russia or the United States from intervention in specific, tacitly agreed areas—for example, Korea and the Persian Gulf—because it has been recognized that any incursion there most probably will be regarded immediately as a *casus belli* with catastrophic results.

To this extent, there has existed for the past five years a curious atomic umbrella, not wholly stormproof, but suspended over the entire field of international relationships—and paradoxically warding off major cataclysms by constantly threatening one. It is this effect on which such strategists as Air Marshal Sir John Slessor rely when they declare that the prospects of major war have receded, since nuclear warfare will be profitless mutual suicide.

Subnuclear Wars

Because major powers are prevented from waging major wars it does not imply that their political ambitions decay—far from it. War being the subordinate instrument of politics, the effect on great powers is to force them to operate through the agencies and proxies of allies and satellites. This is not a simple pattern of activity, because it is complicated by the national and economic interests and jealousies of the smaller nations.

Thus after a series of similar struggles based primarily upon conflicting ideologies in Greece, Korea, and Indochina, we see a complex but old-fashioned struggle between opposing national interests. In the clash of Israel, Egypt, Britain, and France there was a reversion almost to the type of wars past, albeit heavily imprinted with an additional factor of the all-pervading cold war.

After 1945 there was an idea current that the structure of international relations had crystallized into a rigid settled form for a long time to come and was changeable only by negotiation. The Allies had won the war, disposed of the vanquished into spheres of influence and occupation, and the nuclear weapon apparently had rendered conventional warfare obsolete as a method of resolving international differences, so that the old methods of changing frontiers were no longer available.

Russian intransigence and barefaced political warfare, however, soon dispelled any illusion that the *status quo* would be accepted by them. During the subsequent interventions in China and in the Berlin blockade the new ideological alignment of great powers was clearly revealed, but war seemed practicable only for great powers, and that only at great risk.

Under this new dispensation the minor powers gradually have perforce evolved their own *modus operandi*, not only as pawns of the major powers but also as principals. Where their interests coincide with East or West they become agents in warfare at secondhand. As independent operators they may seek to create opportunities in which the major powers are so balanced that they will not interfere with the freedom of action required, for example, Egypt in the Middle East. Such opportunities abound in areas where the decay of the old order has created a power vacuum.

Thus the disappearance of the European colonial powers of Great Britain, France, and Holland, leaving unstable areas in Southeast Asia, North Africa, and the Middle East, has been followed by a series of small wars. In many cases the major powers, Russia and the United States, have been forced to abstain from direct intervention by the prior outright declaration of vital spheres of influence, defensible by nuclear warfare if challenged. This factor arose in NATO and checked Russian designs in Western Europe. Nevertheless, such defensive barriers, based on the cooperation of buffer states, have proved untenable in the event of deliberate noncooperation by the satellite, as occurred with Yugoslavia.

The Middle East is the most recent and urgent field for strategic expansion based upon political warfare and limited wars. It contains all the necessary elements for major conflict under prenuclear conditions, and the campaign now is being waged piecemeal in a minor key. The existence of vital and valuable oil resources around the Persian Gulf, the location of essential communications in the Mediterranean and Suez, the decay of the old Western hegemony, and the rise of nascent nations in Israel, Egypt, Morocco create a peculiarly delicate problem. Overshadowing this problem is the familiar nuclear factor in its normal dominant topographical form.

Thus Britain initially and officially evacuated the Canal Zone because it was, in the final strategic analysis, untenable in the thermonuclear age. The subsequent Egyptian negotiations with East and West were typical overtures under the balance of nuclear powers, designed to encourage higher bids from the major powers. Temporary withdrawal of definite Russian and US support from the area created another power vacuum. If neither major power was prepared to take risks over Suez, the way was open for conventional action.

The Anglo-French forces, therefore, sought to reestablish order and their own interests by military operations. Meanwhile the straight-out national clash between Egypt and Israel created a favorable opportunity, and thus precipitated the Anglo-French invasion of Suez.

Although one of these powers, Great Britain, was equipped for nuclear warfare, there was never any question of resort to this measure. It was limited war for a specific limited object. Russian threats of intervention by "volunteers" raised the possibility of unlimited warfare developing in the area, and the US countered with a warning against extension of the hostilities. It is a moot point whether the threat of ultimate nuclear warfare arising from Russian intervention or the pious invocations of the United Nations were the main influence in securing Anglo-French withdrawal. This, in brief, is the chaotic story of this unfinished imbroglio.

Meanwhile Russia has been experiencing local uprisings in her own buffer areas, with separatist movements in Poland and Hungary and incipient imitations in Romania and Bulgaria. While these are partly attributable to new policies in the Kremlin and to the hardships created by Communist economics, they also are considerably affected by the external strategic factor.

The satellite states, unwilling collaborators from the beginning, are acutely aware of the risks they run as Soviet buffers in the event of nuclear warfare, and of their importance to Russian strategy in the geographical and the economic spheres. Thus emboldened and desperate, they have taken the enormous risks of armed insurrection. Russian counterstrokes have hardened from hesitancy to bloody repression. Tacit acceptance of the area as a vital Soviet sphere of influence and, therefore, a cause of nuclear warfare has prohibited the United Nations from intervention on Hungarian behalf. The lesson will not be lost on other subservient powers, but the unease must persist so long as the causes continue to be operative.

The Israel-Egypt struggle is on a different and more familiar plane than the other operations. The proximity of certain antagonistic Arab States imposes a continuous threat to Israel's existence. The recent operations in Sinai were a preventive campaign. Although external powers may have assisted on either side, they were in no sense principals.

It seems likely that such conventional operations will continue, and that the major powers may become further involved in this internecine struggle, as it suits their own strategic interests. Certainly, Israel must align herself with a major power in order to survive.

The American declaration of an Eisenhower Doctrine for the Middle East, based on the declared intention of the United States to deny entry into that area to Russia, and the promise of economic aid for the rehabilitation of Middle Eastern countries, is a positive and powerful step toward stability in the area. The details of its implementation have yet to be settled. It fills the power vacuum and at the same time drags the shadow of nuclear warfare and massive retaliation over this theater. It is intended to bring order to the present chaos. The final results remain to be seen.

One thing is certain: Russia will not permit strengthening of Western alignment without vigorous political and strategic countermeasures, such as are apparent in Syria.

The Present Anarchy

There appear to be four main possible lines of development in the defense measures of the smaller powers in the future:

1. Solid alignment in one of the two main power blocs.

2. Creation of a third neutral bloc.

3. Independent and anarchic attempts at self-sufficiency.

4. Reliance on a wholly federated world government based on the United Nations concept.

The latter is a distant ideal remote from present practicability; the first and third courses are each likely to be practiced in the near future. The renewed cold war must tend to harden the main blocs. The Indian design for a neutral bloc fails because it lacks "teeth" and true identity of aims among the neutralists. It must ultimately side with one of the major belligerent blocs.

Yet the presence of the nuclear threat could so undermine international confidence as to cause regression to a medieval condition of isolated states, endocentrically preoccupied, militarily, economically, and culturally. There already are some clear signs of this trend when small states like Iceland and Burma and large states like India, seeking safety in active neutralism, must find the role of go-between very difficult to sustain, and real security more elusive than ever, and so revert to passive and ostrich like efforts to ignore the inevitable.

The effect of nuclear war on foreign policy is to make it more analogous than ever before to stud poker. The protagonists are more prone to bluff, and the

stakes alone, in their gravity and solemnity, distinguish it from other games of chance. Thus nuclear weapon tests, particularly in Russia, frequently have been timed to give them political as well as military significance. National strategy thus is handed over to political gamblers. In such an atmosphere the creation of effective military defense, in turn, becomes an intense military gamble.

Certain main trends can be distinguished such as the following:

1. The development of smaller carefully dispersed urban industrial areas better adapted for defense against nuclear attack.

2. The demand of minor powers for categorical guarantees of their defense and territorial integrity from the major power blocs. This will not always be easy to secure or to enforce, since the major power may be exposed to nuclear attack automatically, and even these giants will not be immune to nuclear blackmail.

3. The creation of economically self-sufficient states, capable of withstanding blockade and siege or weathering out a global war. This normally will be done by intensive internal development coupled with stockpiling.

4. The ultimate evolution of defensive military forces of the maximum hitting power consistent with high mobility and the ability to draw logistical support and to mobilize from decentralized garrisons constituting unattractive targets for nuclear weapons. These will be used to deter aggression at home rather than as expeditionary forces, and will have to rely on local militia or partisan reinforcement, once committed. Expeditionary forces will tend to become mopping-up elements to follow nuclear attacks and to occupy ground, and will be strong in armored, airborne, and air-transported formations.

5. Small nations will need to defend themselves against wars of opportunity waged by conventional forces, with or without assistance from major powers, and probably under an intimidatory threat of nuclear warfare.

6. There can be no permanent stability in international affairs, hence increased emphasis will be placed on political and furtive military methods of changing existing frontiers and alliances. Small nations seeking to survive through the patronage of major powers will, therefore, require absolute guarantees, which, in turn, must entail wholehearted committal to the power bloc.

Conclusions

All in all, defense and survival become more hazardous than ever before in modern history. It imposes military and civil burdens of a greater order upon the population, without any practical alternative, and without the certainty of effective results.

Nations often are compelled to adopt defense policies from expediency, not because they are self-evidently right but rather as the lesser of several evils. Their old defense machinery cannot be rejected as obsolete, and the new nuclear weapons make additional demands simultaneously upon aggressors and defenders alike.

Thus we find ourselves requiring defenses against nuclear war of the first order, and against the minor warfare which still contrives to flourish under the atomic umbrella, despite the good offices of the United Nations. The dictum of Heraclitus stands, that "change is the only reality."

Militarily it follows that defense and survival continue to depend essentially on individual and collective human courage. Disarmament trends and promises of universal peace prove illusory, or the fictions of peace-offensive diplomacy. The development of warfare on two planes suggests that unlimited warfare might be avoided by adopting suitable defense organizations.

At present the navies, armies, and air

forces of the world all seek to adapt nuclear weapons within an integrated framework with conventional weapons. Thus inherent dangers arise that any scale of aggression can lead direct to massive retaliation. The creation of a fourth nuclear war force would ensure that fission weapons were reserved as a last resort, thus diminishing the chances of unlimited warfare.

Meanwhile, no free nation can disregard its own defense obligations, however limited or obscure, for by our own will, skill, and effort do we still stand or fall.

Convergencies

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SINCE the last world conflict all the armies of the world have been attempting to adapt themselves simultaneously to the necessities of atomic and peripheral war. This is inevitable, since nuclear weapons have appeared and since the substitution of ideological conflicts for national wars has generalized the action of partisans. One may wonder, therefore, if two types of armies are not indispensable for meeting the demands of the two types of war.

From the remotest times there have been two contrasting styles of war: direct and indirect. This was the result of purely geographical conditions which very early led the eastern nomad of the steppes and deserts into conflict with the settled westerner of the broken and fertile lands. These methods soon interpenetrated one another, however, and where geography lent itself but little to the one or the other, technique and historic evolution were powerful correctives.

Direct and indirect wars correspond to different systems, both as to strategy and tactics. Direct strategy proposes to destroy the enemy's armed forces by battle as rapidly as possible.

Indirect strategy is more patient. It aims, first of all, at undermining the adversary psychologically and materially before finishing him off. He must be made to feel himself inferior, and must really be so, as a result of the actions which have impaired his security and his resources.

Carried to its extreme, indirect strategy implies a victory without battle. This is an inviting thought, and a number of generals of the 17th and 18th centuries have expressed the idea that all other means for conquering must be exhausted before resorting to armed action. Skillful generals seek less to wage battles, which involve risk for both parties, than to ruin their adversary by other means.

The same contrast is seen in tactics. If one resolves to wage battle, the effects of indirect tactics will impart a very particular character to the fighting both in its general plan and in the maneuvers of the lowest echelons.

The Geographical Framework

Western battle essentially is based on an act of force which aims at a breakthrough by strong forces at a weak point in the enemy's disposition.

The eastern battle, on the contrary, attempts to disturb the equilibrium of the adversary from the standpoint of the vigor of his attack. Under his pressure it yields in order to envelop him. Hannibal was victor at Cannae due to a calculated breakthrough of his own center. The Romans penetrated into a disposition arranged for channeling and enveloping them. In real-

ity, the same difference exists between direct and indirect battle as between boxing and judo.

In the middle of the 16th century the advent of the cannon upset the balance of forces. Indirect tactics became impossible on the field of battle, but retained its full effects in harassment. The instinctive adaptation of settled peoples to direct war and of the nomads to indirect war obviously is no accidental phenomenon. It is deeply rooted in the geographical framework which has molded the customs and the minds of the peoples.

Indirect war is the offspring of limitless space and of poverty. The steppe and the desert, by their sterile immensity and their uniformity, engender the nomad-hunter. Accustomed from infancy to tracking and bringing to bay by speed and cunning the game on which he often depends for food, he instinctively makes use of harassment. Indifferent to the unproductive soil, all of which is worthless to him save those points where water is found or which are of religious significance, he is without desire to retain it at any cost.

Direct war is born of the fertile and broken countries of the west. Hans Delbrück in his *History of the Art of War in the Light of Political History* demonstrated the importance of this terrain in the education of the western strategists—a terrain which, as compared with the largely open terrains of the east, definitely is an infantry terrain. It has, in any case, given birth to the settled inhabitant of the west attached to the sustaining soil which is sacred to him both by its graves and its harvests. Every inch of this soil is a reason for fighting and, by its very nature, offers the infantryman numerous points where he may obtain a foothold. Finally, our infantryman is born there, the citizen of a nation and a rationalist through the very play of his interests and his daily concerns.

We have seen settled man adapt himself, out of necessity or intentionally, to certain aspects of indirect war. It is rare that western armies have voluntarily adopted the attack and withdrawal tactics and still more rare, that of continuous harassment. These methods are almost always the result of a situation of inferiority. They accept them when the methods of direct war bear no more fruits. Since the remotest antiquity they have professed a systematic disdain for the tactics of any enemy who refused to cross swords in hand-to-hand combat.

Hence they seek far more to ward off the threat of indirect tactics, than to assimilate it. The permanent reply makes increasing use of closed formations, of terrain unfavorable to the enemy, of the integration of natives familiar with indirect tactics, and finally, and quite as a last resort, the adaptation of the troops of the line to these tactics. The last remedy is extremely rare, and of the Western Powers only the Byzantine used it without restriction.

Strategy

The same is not true of strategy. There are two situations which can give rise to indirect war in the case of the settled peoples: a state of inferiority limited by a natural or artifical refuge, and the impossibility of imposing battle in accordance with their liking, bound to the conviction that it is not a paying means.

In the first case, either the party who is getting the worst of it enjoys a privileged geographical position which enables him to defer the battle (desert or maritime protection, mountainous redoubt of difficult penetration, territorial immensity) or else he makes use of a fortified system which offers him the same advantages.

Let it be noted that only fortifications with logistical capacities answer the purpose. They must be capable of protecting the possessions without preventing the freedom of maneuver of the army. But

tactical fortifications which are employed to enhance the value of a position possess a linear deployment and are effective only in their zone of fire. When a breach is made in the line, the army is obliged to hasten to stop it.

Logistical fortifications are of the enclosed type and are effective within the radius of action of their sallying forces. Not only does their perimeter offer refuge to their possessions and their troops, but their echelonment in depth makes it possible to tolerate the loss of one mesh of the network. This network, moreover, jeopardizes the security of the communications of an enemy who should slip into it, reducing the works as he enters.

From the Middle Ages to the 18th century, fortified postions have almost always permitted indirect strategy. Bertrand Du Guesclin lost almost all the pitched battles that he fought, but he reconquered the kingdom by his incessant raids supported by the fortified positions and castles which he held or methodically seized. The English armies, which could freely traverse France from Calais to Bordeaux without meeting either with battle or subsistence, were ruined.

Before this period the armies could create no detachments because firepower still was inadequate to permit the main body of forces to arrive in time to prevent the destruction of the detachments by the hostile army. Armies maneuvered en bloc and by movement always could avoid coming into close contact with the enemy. The battle usually took place by mutual consent.

Moreover, good troops were rare and costly, considering the financial condition of the states. Battle losses were heavy when one was on the losing side. Finally, the maneuver which brought success had to be undertaken on the field of battle from which one issued en bloc and almost always by means of movements which, executed under the very eyes of the adversary, engaged one with him. Battle was hazardous, costly, and, therefore, undesirable.

As a result the adversaries quickly turned to the indirect war of fortified positions and supply depots, for loss of the army's supplies absolutely obliges one to retreat.

It became a chessboard war with feints and countermarches menacing the sources of subsistence—logistical lines, stores, and fortified positions—or luring the enemy in a false direction while one conducted a fruitful operation elsewhere.

War of Attrition

As soon as the opening up of the dispositions or the saturation of the theater of operations intervened, indirect strategy disappeared from the European Continent. Refusal of battle appeared impossible. At most, one could attempt to join the battle and the attack on one's possessions as soon as aviation was able to strike beyond the line of contact.

As Liddell Hart has shown, realization of the extreme possibilities of the indirect approach finally was lost. Those were the consequences of the brutal translation of Napoleon by Clausewitz. Upsetting of the material and moral equilibrium of the enemy by intervention on the least natural axis, and the most ambiguous one with respect to its possible ends, became unthinkable subtlety. This, of course, gave birth to the war of attrition: that of elephants trampling one another to death in a tunnel.

Thus in the case of the western peoples the disappearance of free space for maneuver and the excessive love of possessions gave rise, paradoxically, to the most gigantic losses of possessions and men that history has recorded to this day.

There are no more paying wars—not even for the conqueror—particularly when we think of the effects of the marriage of guerrilla war and the atom bomb. Without doubt the hope still is held of conquering

without battle by destruction, seizure, or immediate disorganization of the principal vital centers of the enemy. By means of discreet texts, the military attempts to reassure itself by bringing out that there is no advantage in reigning over a pile of radioactive cinders and that the use of thermonuclear bombs is limited by the necessity of sparing one's own troops and civilian populations.

We cannot help thinking that in the climate of ideological war, the seductions of indirect strategy become irresistible. Even the last world conflict saw civilian populations and possessions, both those of the enemy and of reputed friends, suffer under the blows of aviation. One cannot see why this would change.

War of Maneuver

We also are witnessing the "re-creation" of the maneuvering space which opens the same possibilities as in the 18th century. The atomic threat as well as the necessities of counterguerrilla action bring the large units out into considerably larger operational surfaces, whether for avoiding mass destruction or for covering a wide area. In the one case it is the checkerboard of the maneuvering elements separated from one another at atomic security distance; in the other it is the grid of the protective units, still more widely dispersed.

More than this, the varied exigencies of the atomic maneuver as well as the necessities of spatial security call for large intervals between tactical large units or ensembles of large units. This may result either from scarcity of forces materially adapted to atomic combat or from the premeditated reservation of bomb corridors and pockets. Modern bomb lines will be lateral as well as frontal.

It also may result from an unequal distribution of the sensitive zones in the rear areas. In any case the shoulder-to-shoulder era is ending, both for the large and the small units, whether they are fighting in the first line or in the rear.

Necessarily, the tactical problems that will be posed in the two cases will possess great similarities and the traditions of indirect tactics will impose themselves for many reasons.

Every modern divisional unit must combine the movements of its units in the style employed by Napoleon for his army corps. Nothing but the scale and the tempo change.

The dispersed security disposition for avoiding destruction precedes the covered and rapid concentration against the enemy; then the protective dispersal succeeds the combat.

Such maneuvers will have several consequences: a return to the indirect approach; a substitution of the all-arms, autonomous unit for the temporary tactical groupment; and the appearance of reserve coordinating staffs.

This entails attacking with strong forces at a weak point in the enemy's disposition over an improbable axis reserving several possibilities of action so as to keep the enemy on the horns of a dilemma up to the moment of the crushing assault. All this will considerably modify our methods. This requires the rediscovery of the formula for the multiple purpose disposition; a more accurate estimate of the practicability of difficult terrains; and the abandonment of prescribed axes of effort.

When the Grand Army deployed in 1805 east of Olmütz, Napoleon was faced with six possible courses of action and modified his dispositions to satisfy them. In our time we yield to the one case whose realization we aspire. It is a method accurately resembling that of Count Helmuth von Moltke for his campaign of 1870, but it was adhered to as a result of the linear dispositions which, necessarily, had but one possible purpose.

Our modern dispositions, however, which are largely articulated, should permit much more flexible combinations if one is willing to put into action an excess of crea-

tive imagination. The utilization of difficult terrains regarded as more or less impermeable to modern armies has not known so serious an eclipse.

The German armored offensives in the Ardennes and in Greece in 1940 and 1941 correspond to the passage through the Alps of the Great Saint Bernard of 1800. The belief in terrains so strong that they defend themselves all alone is too well-rooted for us not to be able to count on its effects. In an army destined to make its effort in such terrain with its armored and mechanized means, this implies special training.

Finally, in the indirect style, there can be no fixed axis of effort. One attacks where the enemy is weak; one throws in his reserves where the enemy yields. To be sure, one makes plans to guide the action, but it is success which commands it. Any other attitude could lead only to attrition, since the enemy hurries his reserves to the axis of main effort as soon as it is determined.

New Methods

A revision of the methods of combat is more necessary since an atomic reply threatens all direct attack and a badly calculated indirect attack very easily can lead into a vacuum reserved for an atomic explosion.

Substitution of the autonomous all-arms unit for the temporary tactical groupment is required if for no other reason than that it will be difficult for the other arms to subsist alone in the intervals of the disposition without the protection of the infantry. In spite of some reluctance the trend is in the direction of this formula.

As a matter of fact, we are in the presence of a phenomenon as old as the world. First of all, no organism makes up its mind to commit suicide, even though such would be to the general interest. Second, nothing is more difficult than to secure the acceptance of a new idea, unless it is the abandonment of an old one. We are accustomed to thinking in terms of arms, and the all-arms unit carries with it the abolition of the arms as autonomous organisms. Can one image that the "arms" other than the infantry, would accept the loss of their privileges without vigorous objections?

These objections have in common the argument of major efficiency by the concentration of means. How will one obtain massed artillery fire or powerful armored charges if the matériel is dispersed among several all-arms units? Let us note that dispersion of batteries has never prevented a concentration of artillery fire. Signal communications and fire-direction posts provided in the various echelons will secure it.

One cannot see why the all-arms units would reserve the capacity for fire exclusively for their own benefit. This would amount to a negation of mutual support on the part of the units. The same thing is to be said in regard to mass effects of the tanks. If we admit that the essential of the maneuver in atomic war consists in a convergence of the units for the purpose of crushing a portion of the enemy disposition, then in their dispersion after the action the tanks of our all-arms units will necessarily maneuver in concentration.

In short, we must understand the deep meaning of the all-arms unit: its birth signifies that the plan of organization has changed echelon. We must think of the all-arms unit in the terms of the division, and of the division in the terms of the army corps, which signifies that the division is capable of temporarily absorbing additions which are capable of very powerful actions (artillery and heavy tanks).

If we examine the question of surface warfare, the necessity for the all-arms unit is still more stringently imposed because the argument of efficacy by the concentration of heavy means no longer has the same worth. If we truly have need of the fires of a regiment, or of a full bat-

talion of artillery, or of the massed support of a regiment of tanks, we are no longer altogether in the climate of guerrilla warfare.

We are at the dividing line between direct and indirect war the moment the bands are sufficiently organized and reinforced to become an army. Normally, it is not necessary and the traditional organization condemns the command either to transform the heavy weapons units into infantry units, or to assign them missions that do not harmonize with their matériel.

In addition, attack-retreat and harassing tactics are destined to awaken new interest.

Atomic War

In the framework of peripheral war all this is easily understood, as one has to do with the traditional tactics of the guerrilla fighters. It is less obvious in the case of atomic war. This derives from the new necessities for security.

In fact, two principles are imposed:

The all-arms unit necessarily is grouped in order to be able to contain the classical attack until the intervention of the other corps. For this reason it constitutes a paying atomic target.

All units that have revealed themselves to the enemy acquire antiatomic security only when in contact with the enemy.

It is necessary, therefore, to prevent premature location to permit these units to defend the organized centers of resistance without falling prey to an atomic explosion.

The first condition will be realized only if one is able to present a screen of advanced security capable of enticing the enemy for an appreciable length of time without being engaged by him or subjected to an atomic attack. The security forces will be obliged to employ attack-retreat tactics in order to limit contact continually.

When the terrain, in all evidence, imposes the emplacements of centers of resistance, their concentrated occupation subjects the unit to atomic preparation. In this case one must distinguish between the security forces of the centers of resistance and the combat forces which must be posted in a shielded position ready to reinforce the security forces.

After a few engagements the enemy attack will locate the intervals defended by light forces fighting similarly to the security forces and the reinforced centers of resistance. From this moment on the enemy either will decide on classical combat, or withdraw to attack the strong points with atom bombs. The all-arms strong point units, perceiving the break of contact announcing the coming atomic destruction, can only close in after the enemy or abandon the threatened positions. Here, too, there will be a perpetual advance-retreat movement.

In this process the subtleties of the eastern yielding battle will find their present-day expressions, for each side will be bent on drawing the enemy forces into places where the atomic destruction can be employed economically with respect to possessions, populations, and enemy forces.

The atomic battle will oscillate, therefore, between two opposite poles:

Offensively, the desire for security by means of contact (direct tactics) and calculation of the escape maneuvers making possible the use of the atom bomb against known enemy concentrations (indirect tactics).

Defensively, the desire to draw the enemy into areas where the atom bomb may be employed and to get out of the way if contact cannot be reestablished (indirect tactics).

Like Folard, one will conclude:

It is not a case for resorting to weapons fire, but for joining the enemy and first attacking him with cold steel, and then fire

will be out of the question, there will be none to be subjected to it.

But in our present case it will be a matter of atomic fire.

At other times one will recall, very opportunely, that Mao Tse-tung wrote: "Few men know our thoughts and our methods of combat. If there had been more who did, we should not have conquered so often or so easily."

Thus the alternative composition of the hard drive into the enemy's lines and of the attack-retreat will modify the visage of war completely.

Tactical and strategic mobility always have constituted the very essence of war. The misfortune is that, in our day, tactical mobility and strategic mobility seem to oppose one another. To be tactically mobile is to be motorized and mechanized, hence to increase the logistical burden. To be strategically mobile is to avoid these burdens. No armored army has been able to equal Caesar's performances in exploitation. Caesar, when he set out in pursuit of Lucius Afranius covered 215 miles in 10 days before his decisive conquest at Lerida. Patton or Guderian never equaled this.

Today, the risks run by the large logistical installations are, in the climate of indirect war, much greater than those imposed on the armed forces. Logistical deployments are choice targets, whether for atom bombs or for the partisans and paratroops of surface warfare.

Supply Mobility

The mobility necessary for indirect tactics was never exhibited except by the cavalry armed with firearms. One must travel fast and strike from a distance. In our day the practice of alternate concentrations and dispersions, of the attack-retreat, and of the deployed march off the routes cannot permit such maneuver on the part of the present infantry.

In addition, if one requires that the infantry has a minimum protection which will enable it to subsist within a reasonable distance from the atomic explosions and, if the occasion arises, contains massive attacks at minimum cost, one very quickly concludes that for the maneuvering forces and, above all, in the covering battle, armored, full-track transportation supported by a combat weapon of the same capabilities is indispensable.

It is often objected that such forces would be poorly suited for peripheral warfare since difficult terrain with few communication routes is most favorable for guerrilla forces. But this is forgetting that maneuver and combat are two different elements. Whether we have to do with atomic or peripheral operations, one can maneuver in vehicles all one wishes, but one always ends by fighting on foot.

It was quickly perceived that the organization and the qualities acquired in autonomy and dispersion of the units, night combat, and motorized mobility were factors which made for success in counter-guerrilla action. The forces, in both cases, must give proof of power, of ubiquity due to their matériel, of endurance, and of cunning. The two forms of war are complementary, which is not the case when one compares them with classical war.

This point being established, it is not enough to demand lightened logistics to realize this condition. The type and the volume of the forces being determined, the logistical loads that must go to them are irreducible. On the other hand, there is nothing that stands in the way of a logistical system which lightens both the fighting forces and the tactical command, while at the same time retains the same logistical volume.

Such a system has existed for a long time. It saw its birth in the vast areas of indirect war: the steppe in the case of the Russians and the African desert in the case of the English. It is based on three principles:

To as great an extent as possible, logis-

tical operations are handled by the service of the rear, clear up to the line of fire, which makes it possible to transfer to the army the maximum part of the organic logistic impedimenta of the large tactical units.

Logistical operations are set in motion at the initiative of the logistical command which is charged with foreseeing and covering the needs of the combatant automatically and without request from this latter.

The tactical command informs and controls the logistical command, but in general, it does not have to set it in motion. The logistical organization is completely responsible.

It is obvious that the effectiveness of such a system will depend on the operational activity of the logistical officers, who must follow both the foreseeable needs and the development of the combat, and the flexibility of the transport activity, which must continue day and night to cover the needs and the relative security and stability of the logistical bases and lines. The flexibility of the transport activity is very obviously dependent on two factors: the employment of the helicopter type transportation, and the establishment of a plan in which the vehicles (terrestrial or aerial) move in discrete but continual quantities.

On the other hand, the stability and security of the bases, as well as of the logistical lines, pose another big problem. The dispersion of means, which accords relative atomic security, is contrary to effectiveness and facilitates guerrilla actions. Concentration has the reverse effects.

One can easily conceive that the security of the logistical lines will be good inside of the organized disposition of the armies, but that the moving character of the operations will render them very unstable. In the rear areas, on the contrary, one can conceive of a greater stability of these lines, while they will be much more vulnerable.

Renouncing the notion of the continuous front, we must consider the existence of strong zones covering the military infrastructure and defended in a tenacious and aggressive manner. In contrast is the "flat terrain," where mechanized forces will carry on a mobile battle with the aim of subjecting the enemy to atomic blows as well as counterattacks from the strong zones, exploiting the effect of the explosions.

It will be objected that these strong zones run the risk of becoming "atom bomb nests." Still it must be considered that they will have a rather vast extension and that their fortification, of the molehill type adapted to mountainous sites, actually can offer considerable protection.

It would be possible to conceive a fortified logistical grid bordering communication lines and prolonged by army dispositions. As in the 17th century the line of communications is stable and guarded by fortified works, while the army dispositions are subject to variation in accordance with operations. The system is adaptable to atomic war as well as to peripheral war.

It will be argued that the differing missions of atomic war and of peripheral war do not require the same degree of mechanization or of motorization, nor such heavy support. In the one case the combat takes place within the framework of the large units; in the other case the territorial framework predominates.

One cannot fail to realize that a generalized atomic aggression would result in a very considerable disruption of logistical activities. In this case all units of all types will subsist, at least temporarily, on local supplies, with the consequent great chance that their operational possibilities will be modified greatly.

Contrary to what might be believed, these arguments militate for identical structures, it being understood, of course,

that the allotment of heavy supports and transport means would vary. Indeed, these factors require that one and the same unit must be able to pass easily from the framework of the atomic division to the regional framework in accordance with circumstances. Reconversion and bilateral circulation constitute vital necessities.

It must be possible either to transform a heavy unit into a light unit (reconversion) or change it from the divisional framework to the regional framework (circulation).

The Convergence

First of all, we could not count on an army entirely made up of mechanized divisions and armored divisions, for both financial and tactical reasons. Atomic and peripheral warfare necessitate not only capacity for adaptation to all terrain, but also static or semistatic forces (security garrisons of fortresses and vital points). The mobile forces employed in counter-guerrilla operations do not require such heavy support as do the mobile forces of atomic warfare.

In addition to the reconversions, it also is necessary to consider the possibilities of circulation of the units from one framework of war to the other. It is desirable that the forces of static or semistatic character be capable of passing easily from the atomic areas to the vital points and back again. Mobile forces should be able, likewise, to act as a conveyor line for relief purposes or the redistribution of forces, and this at the cost of simple modifications of allotments of heavy matériel and without change of structure. Exchanges of standard units for all-arms units must be greatly favored.

These necessities bring us back to the concept of the all-arms unit. Obviously, reconversion will be easier for men of diverse specialties who are accustomed to living together, than for "specialists" isolated from one another in accordance with the traditional forms of organization.

Finally, they permit us to see, in anticipation, that the rivalry between the commands of the large units and of regions is at an end. We are to rediscover the formula of the Byzantine administrative districts in which the commander of the large unit was the regional commander, or his adjutant. This certainly will render the subdivisions more comprehensive in consideration of the missions of the all-arms units. The all-arms units will be able, on mobilization, to furnish either by splitting-up or by reconversion the battle units deemed necessary.

In whatever direction we turn, in the framework of indirect war we see great areas common to the two types of war (atomic and peripheral).

The question may be posed of whether these convergencies will not result in a complete upsetting of our doctrinal habits and, consequently, of our organization.

The Future

By singular chance we see the tactical and strategic methods belonging to the 17th and 18th centuries again taking shape. We may even foresee that the analogy will go still further, for the cost of a battle conducted by highly trained mechanized troops can possibly result in fear of battle. We could even imagine the same maneuvers, based on fortified positions, as practiced in the 17th century.

Without going to this length—for so far as reasoning is concerned we cannot distinguish sophism from proof except in the light of experience—we may at least conceive a simplification of the organization of armies. The same type of organization meets the various operational necessities, and only the relative allotment of heavy supports, as well as the degree of mechanization, is to be adjusted to the missions. Furthermore, the necessary advent of the all-arms unit will give precedence to the concept of specialty over that of arms.

The personnel of the all-arms unit no longer will constitute an aggregate of dif-

ferent arms, but will be a team, with many specialties just as is seen aboard a war vessel or in a fortress. They will have one commander, one emblem, one formation, and one spirit. Their collective efficiency cannot but be increased as a result, especially considering the perpetual isolation in autonomous all-arms units which will henceforth constitute the norm of combat.

It is not the first time that a reorganization has been adapted to two necessities that were seemingly divergent. In the first century B. C., Gaius Marius was obliged to face simultaneously the Germanic hordes which had just crushed the legions four times in five years, and the guerrilla actions stirred up in Spain and Africa by Viriathus and Jugurtha. The legion he had, possessed a strength of 3,600 men organized into 30 maniples. Its indissoluble ensemble was too heavy for anti-guerrilla warfare and the maniple which constituted the unit of action of the battle disposition was too weak to hold under the deployment of the Germanic hordes. Marius then raised the legion to 6,000 men organized in 10 cohorts capable of autonomous control. The isolated cohort became the pattern of the light columns of surface warfare and the unit of action in the battle disposition. Marius, at one stroke, solved both problems. May we be as fortunate.

Confusion in Military Thinking

Digested by the MILITARY REVIEW from an article by Wing Commander M. K. Chopra in "Indian Air Force Quarterly" July-September 1956.

OBSERVERS have not failed to take note of the fact that considerable confusion in military thought has arisen in recent years. Sometimes this confusion breaks out in a sensational manner following a clash between political leaders and military commanders: the recall of General Douglas MacArthur by ex-President Harry S. Truman is a case in point. Sometimes it reveals itself in the controversies over the composition and role of such bodies as the North Atlantic Treaty Organization and Southeast Asia Defense Organization. It also is brought home by sober military commentators in their speeches and writings, and in such books, for instance, as *The Direction of War* by Air Vice Marshal E. J. Kingston-McCloughry.

Why has this happened? There is so much knowledge to draw upon these days, so much experience to guide, such ample means to get straightforward answers to taxing questions, that the confusion ought not to be there. But there it is, and it is gnawing at some of the basic military concepts.

It seems the following are the four major reasons for the muddle:

Infirm political direction.
Emergence of new weapons as a result of advances in science.
Fresh concepts of strategy.
Interservice rivalries.

Political Direction

A foremost cause of military confusion lies in political confusion. According to the general constitutional practice adopted by most countries, the control and direction of armed forces is in the hands of political leaders; the execution of military policies is entrusted to military commanders. But political leaders are quite apt to project themselves into the execution of these policies as well. Hitler and Stalin became *de facto* and *de jure* commanders, and Churchill directed field commanders personally on many occasions. Thus polit-

ical direction impinges on military thought and practice.

Political direction has become confused and wavering. It is becoming increasingly difficult for a country to adopt and follow a clear-cut political policy. Many ideologies are proclaimed from the housetops; for example, communism, socialism, capitalism, and neutralism. It has become impossible, amid the chorus and clatter, to form governing principles, to pick policies with precision and conduct them with confidence. A number of events have happened since the end of the Second World War which have added to the ideological medley. Changes in China and Egypt, fighting in Korea and Indochina, nationalistic revival in North Africa, and unrest in the Middle East all militate against the evolution of stable ideas.

Finally, there are the violent winds of cold war sweeping over the world, sowing disruption and blowing uncertainties. Cold war certainly is less bloodcurdling than shooting war, but it is more insidious because it poisons minds and creates suspicions which, in turn, keep the world in a perpetual state of imbalance and suspense.

It is in such chaotic conditions that governments unfortunately must function. Under these conditions political direction tends to be halting, befogged, and muddled. And it is under this halting, befogged, and muddled direction that armies, navies, and air forces are formed, funds are provided for defense and war, and military policies are formulated. It is not surprising that military policies often are nebulous and infirm, and even divorced from political policies. No stable military ideas can be formed when the inspiration behind them is unreliable and the aim of national policy not clear.

Sometimes, political direction is vitiated by the very system adopted by a government for its high-level functioning. Opinions are known to jar and clash in the cabinet system of government, and in the process of compromise and patchup, definite decisions are the first casualty. How this happened in the last war is illustrated by the following from *The Direction of War*:

After the German breakthrough at Sedan, the three chiefs of staff for the first time agreed unanimously that now, if ever, was the time to bomb inside Germany and catch the hordes crowding in the narrow passes of Ardennes. It was alleged that the chiefs of staff, having agreed on the bombing of Germany during that morning, sought the Prime Minister after lunch to learn that he was at his usual siesta and had left strict instructions that he was not to be disturbed until teatime. The chief of air staff decided that a decision after that time would be too late to lay on the attacks for that night, so it was left for the chiefs of staff to raise the matter at the cabinet meeting next morning.

Approval for the project was readily given at this meeting, but it so happened that the two leading labor ministers were away at a labor conference on the south coast and the Prime Minister asked the chief of air staff to get their approval the next morning when they would be in London and then he could go ahead. A second night wasted and the enemy still pouring through the defiles from Germany! The labor ministers were delayed on their return to London and so a third night was lost. The next day all were assembled at the cabinet meeting. It was said that, although the two ministers readily gave their consent, two other ministers retracted their former approval and the bombing of Germany did not take place.

New Weapons

In its own time every new weapon causes horror in the minds of people. The cannon, automatic firing weapons, tank, submarine, and aircraft have, in their turn, caused stunning excitement. But the

new weapons of the last decade or so are in a class by themselves. So devastating are they that—according to some—if they are used indiscriminately, they might spell the end of the human race. At least three such new weapons exist now:

Atom and hydrogen bombs.
Guided missiles.
Atomic submarines.

Others might also appear—for instance, the solar mirror to be operated from a satellite directing scorching sunrays upon cities; or G-gas.

The hydrogen bombs which have been exploded by the United States and Russia are said to possess a force of 10 million tons of TNT, and H-bombs having 2,400 times the force of the atom bomb dropped on Hiroshima are stated to exist. This is only a beginning, for scientists say something more powerful and more devastating is in the offing, for instance, a bomb prepared from lithium hydride. Various estimates of the destructive capacity of an H-bomb have appeared. It has been calculated that if an army marched with all its soldiers 100 yards apart, a one-megaton bomb (one million-ton TNT force) could cause 17,000 casualties.

Another calculation reported by Mr. Val Peterson, Federal Civil Defense Director of the United States, is that an atomic attack could kill 25 million people and injure another 25 million.

"An H-bomb could take out a city," said a general.

"With seven of these weapons we can rule the world," said another.

And a scientist has warned that a number of H-bombs exploded simultaneously at various parts of the world could throw the earth off its axis.

Guided missiles are robot machines which can be fired at small or large targets and are under control in the course of their flight. A classical example of this was the German *V-2* of the last war—a pencil-shape missile, traveling at a speed of 3,500 miles an hour, having a range of 200 miles, and carrying a warhead of one ton. General Eisenhower said:

*It seemed likely that, if the German had succeeded in perfecting and using these new weapons (*V-1 *and* V-2 *missiles) six months earlier than he did, our invasion of Europe would have proved exceedingly difficult, if not impossible.*

Various types of guided missiles have been developed since the *V-2* and the highly tricky question of guidance, whether electronic, ballistic, or celestial, has been tackled by some of the finest brains. The ultimate aim is to develop an intercontinental missile—in fact, one is already said to exist—with a range of 5,000 miles and capable of hitting within five miles of point of aim. The warhead would be an H-bomb.

In regard to the submarine, "it has been estimated that before the German undersea fleet was defeated, several millions of tons of shipping were lost, 100 billion dollars had been expended, and one-fourth of the scientific talent of the United States and Great Britain had been occupied with submarine defense."

Since then the submarine has improved. The snorkel tube, permitting a submerged submarine to draw air from the atmosphere, has made detection by radar almost impossible. Speed has gone up due to better propulsion methods. Improvements in food and oxygen supply would enable submarines to keep under the water for longer periods.

Above all, submarines have been fitted with atomic engines and can carry aircraft. The advantage of the atomic engine is that it can operate without air, has negligible fuel requirements, and enables the submarine to cover almost limitless distances. The aircraft-carrying submarine could launch jet fighter-bomber strikes almost anywhere on earth and then safely disappear into the depths of the sea.

These weapons have given rise to some

strange ideas concerning the armed forces.

Combined, they command power, speed, and range of staggering proportions. Any part of the world could now, or in the very near future, be hit quickly, precisely, and so terribly hard as to get written off, together with its population, industry, and network of civilized life. Mr. Nehru said: "The genie that came out of the bottle will ultimately swallow man."

Is there not, it is asked, some truth in the saying that either war should now abolish itself or it will succeed in abolishing mankind; that war is an insane folly which has lost its purpose because of the havoc it can cause on a global scale? If a belligerent should succeed in conquering territory, such a territory would not be worth possessing, for it would be a wasteland full of charred hollows, radiation fallout, and ghosts of the dead millions. War in this atomic age has ceased to be an instrument of policy; it does not pay and is cruel and immoral. Therefore, goes the argument, armed forces have no reason to exist for war and no reason to consume a high percentage of national finance in peace.

But armed forces still are necessary, even though the pattern of the military machine is changed and its various elements have received reoriented emphasis due to the new weapons.

Manpower, weapons, organization, communications, discipline, and morale formerly were important elements contributing strength to sea, land, and air forces. A wise commander gave appropriate place to each one of them in his scheme of things. However, with the arrival of the fission and fusion bombs the balance has gone so heavily in favor of the weapon that the rest of the military components seem to have assumed a strange insignificance.

There is a dismal truth in what J. F. C. Fuller states in his *Armament and History*:

Tools, or weapons, if only the right ones can be discovered, form 99 percent of victory. . . . Strategy, command, leadership, courage, discipline, organization, and all the moral and physical paraphernalia of war are nothing to a high superiority of weapons . . . at most they go to form the one percent which makes the whole possible.

Strategy

Strategy, "the art of war," met with considerable transformation in World War II as a result of the full-dress employment of airpower. At the end of the war, experts were assessing the new factors in the context of "grand slam" or "blockbuster" bombs, the atom bomb, and sonic speeds. Then came the H-bomb and rapid improvement of guided missiles which upset many an applecart.

Between the two aspects of strategy—the offense and the defense—the offensive has, with the new weapons, become more crucial than before and overwhelmingly decisive. The initial atomic attack, delivered at an enemy's home base, will so heavily deplete him of his manpower and destroy his means of military production and capacity to transport it to the theater of war, as to cause instantaneous defeat. Many strategists recently have talked of a 36-hour war, or 36-minute war for that matter, the war that is fought and finished on the pushbutton pattern. However fantastic, such a war is possible now, in which one megaton bomb could, for example, wipe out the whole of Delhi, and could be launched anywhere from Japan, Africa, or Europe.

In this type of warfare it is obvious that victory will be favored heavily by the employment of initiative, and surprise will have a higher value than any other principle of war. Surprise which takes the form of attack without an ultimatum of war may be considered out of court in the code of warfare. And yet such a surprise has been used—for instance, by Japan in her attack on Pearl Harbor—and is much

more likely to be used in the future by a belligerent. Some would call him treacherous, no doubt, but in this age of the H-bomb it may be better to be treacherous than to be unwise—in the interest of survival.

Consider in this light some outstanding strategic feats of World War II—Operation *Overlord*, for instance. This was conceived after prolonged wrangling among the Allies. Thousands of brilliant staff officers planned it. Never were more men, weapons, and equipment piled up at one place to execute an operation. It took two years to come into being. Would not all that look like insane fuss to a supreme commander of today having a stockpile of H-bombs and efficient means of delivering them from hundreds and thousands of miles away?

The initiative in the atomic attack and its split-second timing presents the first dilemma of atomic strategy.

Other dilemmas also are apparent. A few years ago the strategy of "master deterrence" gained currency in certain quarters. This meant that with the abundance of atomic weapons at your disposal, you could threaten the enemy into keeping peace. In this way, it was argued, the H-bomb would be a guarantee against the outbreak of a major war.

Professor P. M. S. Blackett pointed out two years ago that the theory of master deterrence worked only so long as one party had the H-bomb and the other did not. It failed when the H-bombs ceased to be a monopoly of one belligerent, particularly when their know-how became common property and their manufacture became cheap. And the argument goes on, for and against.

Another dilemma is presented by the strategic conception of planning for a major war as well as a local war, the former to involve full-scale use of atomic weapons and the latter mostly conventional weapons. It is pointed out that due to the arrival of the ultimate weapon, a major war might be averted—at least for the time being—but there is nothing to root out local conflagrations, such as in Korea. Therefore, it is argued, an armed force ought to have two wings, the atomic and the conventional. The difficulty lies in determining the size of the two. If too much emphasis is given to the atomic wing, the capacity to meet local eventualities is weakened. If too much emphasis is laid on the conventional wing, the deterrence underlying atomic weapons is whittled down. Once again the planners are at loggerheads.

Is there any defense against atomic attack? Many experts have pointed out that this, in fact, should be the criterion for formulating foreign policy, and not the doctrine of the master deterrent or massive retaliation. Any atomic attack would lead to a counterattack by the enemy in the same coin, and the point is whether this counterattack could be defended against, and if not, whether the original attack was at all wise.

A chasm seems to have arisen between those who rely on effective defense and those who rule it out completely. The former vaunt the four principal components of defense, namely, the guided missile with atomic warhead, cannon firing A- and H-bombs, day and night fighters, and efficient warning systems, particularly electronic.

They point to the great lesson of history, that to every offense there is a defense, and see no reason why this lesson should not be applicable today with the aid of science and technology. The latter are, however, quick to seize upon the leaks in the defense plan. The utmost that this plan could achieve is to prevent one out of every four raiding aircraft from crashing through the defense screen. This certainly is very good, for in the last war if one aircraft could be brought down out of every 15, the defense was considered effective. On the other hand, in atomic war

almost 100 percent defense is necessary, and a mere 25 percent defense is completely useless. "There is," remarked Einstein, "no military defense against atomic bombs."

A concrete suggestion to prevent a country from complete desolation following atomic raids is sometimes made. This is to organize dispersal on a grand scale—dispersal of populations, cities, and industries. No such course appears to be feasible, social conditions being what they are. Considering this, many wonder whether thickly occupied areas which could not be relieved of their congestion and small countries which lack open spaces have any future in a world of H-bombs.

Interservice Rivalries

Many who regard the defense services as the last word on discipline and order are surprised there should be rivalry among the land, air, and sea forces. Others, the extremists, who claim to be aware of the storms brewing in the interservice hinterlands are equally surprised that these are called mere "rivalries." Interservice "split" or "sniping" would be the word.

As late as 1955, Air Chief Marshal Sir Philip Bennet Joubert de la Ferte declared in his book, *The Third Service*, that the British Army and Navy were undercutting the Royal Air Force, and pointed to the insidious attempts directed at depriving the air force of first-class aircraft in the numbers required. More recently there were reports of blatant conflicts among the US Army, Navy, and Air Force which had erupted from the inner enclaves to public platforms. It is also well-known that in a number of countries where local rebellions have occurred, the armed forces have split and each service decided in its own way to side with the rebels or the government.

Judging by the historical developments of the three services during the last 40 years or more, a certain amount of friction among them was only to be expected. In the United Kingdom in 1918 the RAF became an autonomous service on a level with the navy and the army, and the two older services surrendered their air components to the new air arm. This also happened with the United States Air Force at the end of World War II. A lot of heartburning ensued as a result. It is surprising how old jealousies simmered even in the midst of the life and death struggle of 1939-45.

Air Vice Marshal Kingston-McCloughry mentions in his *Direction of War* that on one occasion the relations between the Air Ministry and War Office were so strained that he could not obtain from the Army High Command any information about the movements of the British Expeditionary Force.

When World War II ended, one thing was as clear as daylight—airpower had a distinct and unique role. In the importance it accrued from mobility, range, and strategic potential, it might even outshine the other two services. It seemed then that the air force, the embodiment of airpower, had its position established and accepted in the family, and all three services were on their way to coexistence. This, and other reasons, led to a compromise concept in the armed forces organization, the concept of "balanced forces." According to this the services were to be treated at par, each was to be apportioned an equitable share of finance and assigned its due role, and all were to be trained ultimately for a combined task for the achievement of common aim.

In most countries the "balanced force" idea holds the field today. Since 1952, however, when the H-bomb arrived, fresh controversies have been touched off. It has been said that as the carrier of the H-bomb, the air force overnight has become the dominant arm with the issues of victory and defeat in its pocket. The H-bomb is claimed to have rendered obsolete a number of highly prized weapons of the last

war—the aircraft carrier; for instance. With the aid of guided missiles and A- and H-bombs, war would start and end before the land and sea forces received orders to move.

The army, on the other hand, maintains that the soldier is needed to fight in all local wars and for mopping up and holding the conquered land in major wars.

"What right has the airman," says the soldier, "to have all the aircraft and all the missiles?"

"It is wrong to imagine," said a general recently, "that all that walks belongs to the land forces, all that swims belongs to the sea forces, and all that flies belongs to the air forces."

The United States Army, so *Time* reports, which once had 200 aircraft, now possesses 4,000 and aims at 20,000; and it has developed its own guided missile, the *Nike*.

Interservice rivalries (or sniping) have engendered conflicting opinions about a number of vital military matters. To what extent shall we introduce the new weapons, retain the old, discard the obsolete? Who would control the new weapons, particularly guided missiles?

The organization of the three services—with their watertight traditions and streamlined loyalties—into autonomous arms may itself be wrong. Do not the so-called interservice committees, joint bureaus, and combined operations theaters tend to function at cross-purposes? And when there are such basic differences about weapons, military roles, and organization, what are the chances of arriving at a clear-cut national strategy?

Conclusion

These are some of the military dilemmas of today. From the purely technical questions such as what weapons to employ, what technique to follow, and what organization to form, more fundamental questions arise. What shall we fight for and shall we fight at all? Obviously, the definition that a military genius gave to war—that war is a continuation of policy by others means—is much too naive in these kaleidoscopic times. The "policy" is not there and the "other means" are in confusion.

Officer and Technique

Translated and digested by the MILITARY REVIEW from a chapter in "Vom Künftigen Deutschen Offizier" by Major Rolf Eible. Copyright by Offene Worte, Bonn, Germany.

. . . you may ask counsel of the subordinate with regard to given matters, but not with regard to the intellectual intention back of them.

—Ernst Jünger, *Strahlungen*

FAMOUS personalities in the past repeatedly have called attention to the dangers surrounding the human individual in the technical era: the danger of becoming the vassal of material things, of figures, of the formula, or of the machine. The result of this is an absolutely incapacitating fear which already holds sway over broad circles of humanity to the point of fatalism. The steadily increasing importance of technique in modern armed forces naturally makes necessary a review of ideas formerly held.

Ernst Jünger writes of advanced technical weapons guided by robots which observe their target at a great distance. Equipment with such robots swallows up the lion's share of both the work and the

costs—this is one of the indications of the extent to which the technician has replaced the soldier. To the latter is left the role of pressing the famous "pushbutton" —which possesses a deadly resemblance to an execution.

The odium also remains clinging to the soldier, while the technician plays the philanthropist.

Even though Jünger in his reconciliation of astronomy and physics with theology sees signs that technique will in the end permit itself to be dominated by man, the problem has not yet been solved. This irruption of supertechnique into the customary circle of the soldier's existence, however, is but one aspect of the soldier-technique encounter.

Since war has existed the soldier has been dependent on the technical status of his age. New technical means alter the armament, the organization, and the engagement of units. Even back to the earliest times there have been repeated cases in which the conservative obstinacy of military circles has hindered the adaptation of the military organization to technical advances. Disadvantages on the field of battle have been the logical consequence of such lack of understanding. We need only to call attention to the delayed recognition of the significance of the submarine, the tank, and radar.

Vision

But such shortsightedness with respect to technical matters has by no means been common to all former military leaders. For instance, in 1843 Field Marshal Helmuth von Moltke published an article with the title: "Considerations to Be Taken Into Account in the Choice of the Direction of Railways." In the war of 1866 the railway network largely formed the basis of Moltke's plans of strategic concentration. Directives prepared by him in the name of the King reached the commanding generals by telegraph.

In a session of the Upper House of the year 1879 concerning the nationalization of railways, Moltke said: "The railways have become one of the most important military means of our day."

Field Marshal Alfred von Schlieffen also gave proof of very clear vision in technical matters. In a study entitled "War in the Present Period," which was published at the beginning of 1909, we find the following:

The military leader finds himself farther to the rear, in a house with spacious offices, where wire and wireless telegraph, telephone, and signal apparatus are at hand, and where assemblages of motor vehicles and motorcycles equipped for the longest journeys await. . . . The cartridges carried after the forces in trucks form the best and most dependable reserves. . . . In order, however, to attack an enemy flank, one must know where it is. The task of determining this was formerly assigned to the cavalry. It is to be hoped that in the future this mission will devolve on a fleet of dirigible airships which from above can maintain a better view than the cavalry whose view is hampered by mountains, woods, and inhabited places.

With these words the importance of "operational air reconnaissance" was recognized almost 50 years ago.

In spite of his clear conviction of the importance of technical innovations and the resulting furtherance of balloon troops, railway troops, and mobile heavy artillery, Von Schlieffen also knew clearly where to draw the boundary line of this importance with respect to war:

. . . for there will be no change in this, even in the future. To a greater or a lesser extent, artillery will first have to be employed aginst artillery, cavalry against cavalry, airship against airship, until all of them combined are able to help the infantry to final victory.

For Von Schlieffen, too, the principal mission of the technical weapon remained

the support of the purely combat forces, the infantry. Thus a mainly *helping* role devolved on technique, although the significance of this help increased with its development. Leading American military leaders such as Generals Matthew B. Ridgway and S. L. A. Marshall have stated that technique, in spite of the decisive position it now occupies in the general military setting, above all continues in its "helping role." The employment of thermonuclear means of mass destruction could, it must be admitted, shift the center of gravity in the direction of technique.

Among the technically alert German military leaders, General Heinz Guderian must by no means be forgotten. His principles of employment and command were the first to raise the armored arm to the height which led to corresponding victories.

Evaluation of Technique

In spite of this, however, it is not to be denied that in many fields the possibilities and limitations of technique were not evaluated to a sufficient extent within the German Wehrmacht of World War II. Often there was lack of the requisite technical knowledge on the part of the leading authorities. The result of this was a misplacement of emphasis in research, an incorrect emphasis in war production, and even the improper employment of technical combat means, especially in the Luftwaffe.

Modern combat forces are far more dependent on technique in their readiness for engagement and in their combat strength than was ever the case before. The specialist plays a decisive role. Complete mastery of all technical details of weapons and apparatus no longer can be expected of the troop officer in the future. Due to this, however, he is freed of a part of his former task—the supervision of subordinates in all respects.

Heinz Karst has dealt with this subject in a particularly thorough manner. In his opinion the inevitable consequences of this technicalization are increased responsibility in the lower grades, a change in the relationship between soldiers, and, lastly, an almost partnership-like relationship between higher and lower grades without, however, eliminating the obvious responsibility of command. All in all this means greater demands on both officer and man with respect to technical knowledge and mutual confidence. Technical knowledge can be learned, but confidence must be formed on the basis of a common sense of responsibility to the state.

Karst especially warns against overdependence on the technical expert. His important place in the military activities of tomorrow must be admitted, yet he must not be permitted primacy over the tactician—the soldier—who has to bear the responsibility for the military action.

Every genuine soldier must realize that technique has only a serving function in war, and that endurance of the battle is possible through support from spiritual sources, and not necessarily by technical routine alone.

Machines and Leaders

The officer is no longer merely the commander, but in the serving of his weapon (plane, tank) also exercises a function like each of his subordinates. The "superior-inferior status" is changed, therefore, to a more mutually dependent relationship, a "partnership-like cooperation." In the partnership thus developed by the common responsibility of technically specialized teams, there arises a phenomenon which, at the same time, deepens and objectifies the inner value of this comradeship.

General S. L. A. Marshall stated that the adaptation of man to the machine is one of the most important requisites of modern soldiery. The soldier must not feel himself alone in the emptiness of the

modern battlefield, but must know that his comrades also are participating in the developments. Only when the human and not the material points of view of the operation occupy the foremost place can tactical formations be expected to do their best as units.

General Georg von Sodenstern does not believe that the soldiers of tomorrow will lack technical knowledge. Youth is growing up in the midst of technical apparatus. He sees the greater danger in the possibility that technique and mass employment, even in the military area, will cause the new type of commander to be more of a manager than a soldier.

He compares the art of creative leadership with this disquieting prospect and cites Clausewitz on military genius. Von Sodenstern also comes to the conclusion that the primary authority in the military domain, in spite of all technical development, continues to belong to the military commander rather than the technician.

Actually, it makes absolutely no difference whether the correct decision must be made on the basis of the range of an arrow or of hundreds of miles; whether it sets in motion the wing echelons in Hannibal's Army for the outflanking of the Romans or unleashes the breakthrough of an armored army and its junction with airborne units deep in the enemy's rear area. Today, and in the future, the issue will be, as then, that "military genius" recognize and utilize its hour.

General Albert Praun states, on the basis of numerous examples from the most recent German military history, that the advances and possibilities of technique often are not met with much understanding. With respect to the relationship between command and technique General Praun expresses himself to the effect that the "council of war"—the consideration of differing opinions—has no place in the tactical and operational command.

Here, command is from above, downward. Technical decisions relative to the use of combat means are no longer conceivable without the horizontal participation of scientists, industrialists, and soldiers.

Conclusions

If the officer of today is without some technical knowledge, he is no longer equal to his task and will have to seek the aid of the specialist for extremely specialized individual questions. This assumes mutual understanding and mutual esteem—partnership in the common objective. Whether and to what extent this "partnership" can and will lead to a leveling-off of the relationship between superior and subordinate remains to be seen. It would be a mistake to see, however, in this outward leveling-off a menace to the position of the officer. On the contrary, jointly responsible partnership creates stronger bonds than "commanded authority."

In the domain of his own arm the officer will have to master technical details. In the case of technical combat means, whose possibilities and limitations the responsible troop officer is unable to judge on the basis of his own knowledge, he will be obliged to orientate himself thoroughly before making his final decision. In all cases the repercussions of technique on human relationships will, even in the military domain, make particular demands in regard to the command personality and maturity of character of the officer.

The Place of Guerrilla Action in War

Translated and digested by the MILITARY REVIEW from a copyrighted article by Colonel Nemo in "Revue Militaire Générale" (France) January 1957.

GUERRILLA warfare is one form of war often neglected by military writers, and for a long time regarded as minor. At times, commanders used it, but more often they merely took advantage of circumstances outside their own control but which they had perceived could help them in the accomplishment of their mission.

Guerrilla warfare has been given little emphasis in official history. Nevertheless, regular armies have almost never succeeded in gaining the ascendancy over guerrilla operations of any importance. Perhaps, it is because of a subconscious desire to hide this impotence that the great commanders have minimized the role of guerrilla operations.

All guerrilla warfare is, moreover, essentially mysterious. It is difficult to analyze its motives: they are too numerous and too diverse to provide for a clear and accurate analysis such as the historians like to make. They lend themselves, much more than the causes of an open war, to multiple interpretations in which it is difficult to remain truly objective. These motives go back to the fundamental concepts of the relationships between men and nations; they always possess a certain degree of present applicability, and often are located at the very roots of discussions of the moment.

A multiform and complex phenomenon, guerrilla war escapes the habitual methods of military history. The determination of the social factors which provoke and orient war, and their respective influences and reciprocal interferences remain the object of much uncertainty. Since even the most classical form of war is the object of many different interpretations, why should not guerrilla war with its closely intermingled political and military factors be the object of still more numerous and still less satisfactory explanations?

The expression, "guerrilla action," designates many activities which may differ greatly. Applied originally to operations conducted by partisans in contradistinction to those of regular armies, it is far from applicable now. It has become a habit to include all activities outside normal military operations under guerrilla actions, and this expansion of the meaning of a word is proof of the development of the thing it represents.

Forms of War

War no longer signifies a clearly determined state of international relations codified by international treaties and possessing its own laws. Between the state of peace and the state of war there exists now, in addition to declared war conforming to the old customs and traditions, numerous intermediate forms of international conflicts. These can be categorized easily as generalized war, limited war, and cold war. Each is characterized by a different expression of an identical fundamental fact: keen rivalry between states, whether it is manifested by the active operations of their armies or by a more subtle maneuver of political, economic, or psychological factors.

It is more difficult to fix precisely the limits between these three categories. Field Marshal Bernard L. Montgomery, in a conference made before the Royal United Service Institution, proposed definitions which have the great merit of being very clear and of not lending themselves to ambiguity. They have been adopted here with a few minor modifications and a few comments.

Generalized war, which draws the

greater part of the population of the globe into one or the other of the two opposed camps, is characterized by the fact that it makes use of nuclear and atomic armaments. The initiation of such a war is, therefore, reserved for those nations which possess these armaments—at the present time, the United States, Great Britain, and the USSR. There is little probability that such a war could remain confined to a single country. It would unavoidably draw into the wake of the "atomic nations" the cortege of their allies or of their satellites.

Limited war is that in which only two groups of belligerents are engaged and in which no employment is made of nuclear weapons. It is, therefore, limited by the extension of its theater of operations and by the types of weapons used. The expression gives the idea, however, of localization in a relatively limited area, while the definition is applicable to major conflicts in which groups of states may be involved. Hence it is necessary to divide this category into at least two different types—wars which break out between sovereign states or group of states, and those which are provoked by a rebellion within a state or, more often perhaps, within a vast political ensemble such as the French Union or the Soviet Union, for example.

In the first case, we find a war that could be qualified as normal; in the second case, a civil war. All these distinctions are not merely academic. They have their importance from both the speculative and the practical points of view.

Finally, cold war includes all forms of hostile relations between states or groups of states with the exception of the engagement of armies. These, however, do play a role; they are a permanent threat, brandished at the moment dictated by the strategy of propaganda and of the psychological maneuver.

Although these definitions appear to delimit the three principal categories in which each war may find its place, the partitions set up between them are, in reality, far from being as tight as they appear. Except in the case of an "atomic" country deliberately deciding to attack an adversary who has been chosen as victim, generalized war can only be the consequence of a foregoing period of tension—of cold war and, perhaps, of limited war. The experience of these recent years shows that cold war at times experiences "hot flashes," that is, limited wars of the civil war type. Therefore, one passes easily from one category to another. But while cold war leads almost naturally to limited conflicts, it is able to start a generalized war only if those who are directing it decide to cross the "atomic threshold"; and at the present time this threshold is a sufficiently high barrier to cause all nations to hesitate crossing it.

Guerrilla Actions

There was no room for guerrilla actions in the relationships formerly maintained between states in peacetime. Cold war, as just defined, is carried on in an international situation which is a peacetime situation juridically. There is no doubt that it is the expression of sharp tension which is more closely related to war than to peace.

Throughout the duration of a given phenomenon such as terrorism, guerrilla action does not appear until a certain degree of intensity has been exceeded. Discernment of the moment when this changeover occurs is always a delicate task and there is great risk of its occurring late.

Guerrilla action has indefinite boundaries with respect to periods of peace, and with regular operations when it becomes almost confused with them. Between these two indefinitely defined frontiers there exist infinite intermediary forms.

The only characteristic in common possessed by these multiple forms of guerrilla war is coexistence, on the same territory, of opposed elements. One is perfectly aware of the fact that two armies,

freed from the constraint of fronts, are able to maneuver widely on one and the same area. All wars except the last two World Wars have consisted of deep maneuvers over a theater of operations much too vast to be saturated by the forces placed in the line. It has never occurred to anyone to designate these wars as guerrilla wars. The fact is that in guerrilla war there enters another factor which permits distinguishing it from regular war. This factor is the juridical concept of an official authority with legally conferred powers over a definite territory. There is no guerrilla action except in the measure that violence is employed against this officially recognized authority.

The operations conducted by the troops of General Francis Wingate or by those of General Frank Merrill in Burma during the last war were not guerrilla operations. They were long raids into the interior of the Japanese disposition. But they were supported by the action of local elements especially recruited for harassing the Japanese lines of communication and obtaining information. This action fitted perfectly into the framework of guerrilla action.

When the regular Vietminh divisions infiltrated into the Tonkin delta during the course of the war in Indochina they were conducting guerrilla operations. At Dien Bien Phu they were just as obviously waging war.

It is not, therefore, the nature of the forces engaged that determines whether their action is or is not guerrilla action. The criterion which permits the distinction between it and regular operations is much more subtle:

Guerrilla war is the ensemble of the actions supported by violence and conducted by an adversary on the territory whose political administration, economic management, and military occupation is officially in charge of the other adversary.

This definition is a general one, but it takes account of one fact which is at the root of all guerrilla warfare: this fact, disputed from the standpoint of rightfulness but undeniable from the standpoint of reality, is that one of the parties officially has social responsibilities over a given territory.

The essence of all guerrilla activity resides precisely in the fact that the right to exercise these responsibilities is refused the one who possesses them in reality by the one who considers he should rightly possess them.

In appearance all guerrilla activity is based more or less on a principle of justice. It is primarily ideological rather than material. This is what gives it force, for it calls for the devotion of the men it utilizes, a voluntary devotion for the great majority, and total devotion on the part of the best of them.

Since all opinion with regard to right is subjective, guerrilla war is an element of discord. It is vain to hope that the totality of a population will adhere to the same concepts. It is necessary, therefore, to win it over to certain ideologies and obtain from it sufficient discipline to permit action. Even in the most favorable cases, guerrilla action contains in its own nature a ferment of civil war.

Nevertheless, the experiences of recent years bring out considerable differences between the varied forms of guerrilla actions which have been utilized in Europe and in overseas countries. In each of these two cases important shades of difference can be seen.

There is one immediately obvious difference: the phase difference of the moments when they occurred.

The West

During the Second World War guerrilla action was born in the European countries from a reaction against the occupant. It was not, generally, a spontaneous phenomenon. It died out as soon as the Allied

regular armies were able to take up the struggle and conduct it in accordance with the rules of classical strategy. Following military reverses, it attempted to compensate for them to a certain degree until the moment when reverses passed and successes would begin. Therefore, it played a waiting role, in a way, without any higher aims than to provide effective aid in the regular military operations.

The militarization of guerrilla warfare seemed a normal phenomenon. In fact, the education and the reflexes of the European peoples are such that they would normally consider that while war is an essentially military affair, it is still an affair to which they would contribute with all their means. Moreover, these peoples were under the domination of foreign armies. The most visible occupant was the enemy soldier. It was his presence that the patriotic mind revolted against, manifesting itself by an imperious desire for liberation. This dominated all other tendencies. The reaction against the occupant was a reaction of violence; an elementary reaction, reflex in its pure state. Such powerful feeling could be expressed only by force. It was entirely normal that the military aspect of the matter largely should dominate all the others.

In the democratic countries the political parties were not prepared for the employment of force. They were organized with an eye to parliamentary struggles and to propaganda in public opinion by traditional means. Even if they attempted to use the situation to obtain a better position for themselves, their struggles and their rivalries seemed of little importance alongside the principal objective—the liberation of their territory.

In the Communist countries all argument of political problems would have been impossible. There, also, it was necessary above all to liberate the national soil. The difficulties which the USSR had to face prevented her from attempting to install the Communist regime in all of Europe. Conducting a hard war, having suffered very heavy losses in human lives and very grave material destructions, and asking aid of the Allies in her war effort she was certainly not in a position to serve as the foundation for world revolution.

All this explains how and why the guerrilla war of the countries of Europe remained military and defensive. The very term "resistance" emphasizes this double character.

Early in World War II the guerrilla operations of Burma, the British effort in Malaya, and the French attempt at resistance in Indochina were only side issues of the regular war. Those who conducted it and those who made use of it never had any other objective than to favor the military operations of the regular forces.

The Chinese and Indochinese Communists participated in the same activity but not without an ulterior political motive, seeking to achieve results which would appear after the war. But as long as the hostilities lasted, they contributed to the harassment of the Japanese forces, hence to guerrilla operations in their military form.

It may be deduced that it is not locational circumstances that determine the characteristics of guerrilla warfare. These depend on the form of war, on the form of a vast phenomenon in whose framework the guerrilla actions are conducted.

It also can be concluded that military guerrilla operations conceived as a useful complement to the operations of the regular forces are not indispensable to their development and their success. Even if it is beyond all dispute that they played an important role in the development of World War II, the war would have been won by the Allies even if guerrilla action had not been undertaken. Success would have required more time, but it would not have been jeopardized.

The East

The study of guerrilla operations of China, Indochina, and Malaya leads to entirely different conclusions.

In China the new revolutionary strategy directed the conquest of the country by the Communist forces. Mao Tse-tung was in a good position for applying his ideas. He was able to combine closely the employment of the regular forces and the guerrilla forces by broadly expanding the field of the latter into the domain of politics.

In Indochina this same combination was effected all throughout the war. The progressive creation of the regular armies neither resulted in a diminution of the intensity nor the effectiveness of the guerrilla operations. On the contrary, they considerably increased them. As in China, success was the result of this skillful combination.

In Malaya, on the other hand, the insurgents of the jungle were unable either to constitute regular forces or any vast national movement in a population divided by race and material interests. Making use of guerrilla action alone in the form of generalized terror, they were not able to obtain the decision although their action largely hastened a necessary political evolution.

Seemingly, these experiences only confirm a fact that has long been known: guerrilla action cannot conquer if it does not receive aid from regular forces, or if an outside political event does not create a situation from which it will benefit. But one must go further than this simple conclusion.

For reasons already known, guerrilla action in Europe was a result of the initial failure of the Allied regular armies. In Asia, after the Second World War, guerrilla operations preceded the entry into action of the regular formations. In Europe the intervention of the armies marked the end of the guerrilla operations, and in Asia it gave them a new impulsion. Why such contrast in the place and in the role of a phenomenon which might seem alike in both cases?

It comes chiefly from the fact that in Asia, as in other overseas countries, revolt against the national or colonial administration was accompanied by a social revolution whose aim was to accelerate an indispensable technical evolution. This was a cause which was proper to each of the countries considered. But there was also another cause of equal importance.

The USSR, incapable of serving as the instigator of world revolution at the moment she was invaded and faced with the greatest difficulties, had recovered her potential and was thenceforth able to assume a role which she had always assigned to herself—that of being the world center from which would radiate ideas, doctrines, techniques, counsels, and matériel to the peoples desirous of shaking off the yoke of ancient political and social formulas.

The principles and methods of the revolutionary war are quite well-known. As already emphasized, guerrilla war contains in itself a ferment of civil war. It is the natural form of revolutionary action. In these new countries it permitted and covered a sufficient mobilization of the social milieu in China and Indochina to be crowned with success, but it was insufficiently developed in Malaya to attain the hoped-for results. It is quite evident that we are a long way here from "small war conducted by partisans." Guerrilla war acquires titles of nobility. It becomes an indispensable element of revolutionary strategy.

Without developing this point any further, it may be stated that without guerrilla action the operations conducted in Asia would not have been crowned with success.

Military, defensive, transitory, and useful—but not necessary in World War II —guerrilla action revealed itself as total,

offensive, permanent, and indispensable in the conflicts which followed it.

The Future

Must we conclude from this that in a future war conducted principally in Europe it would retain the characteristics it has already shown or, on the contrary, that it would assume those of the most recent conflicts?

One easily thrusts aside the objection that the terrain in Europe does not lend itself to guerrilla operations. It does not permit guerrilla operations such as were conducted in the rice paddies or the jungles, certainly, but its methods of execution could definitely be adapted to the conditions of the place and the moment. Guerrilla action does not depend, to any greater degree, on the nature of the elements that conduct it. Regular forces, providing they have received suitable training, perhaps even better than special units are able to carry on guerrilla operations.

In Europe the complex structure of social life renders the different elements dependent on one another. The administrative machine and the economic organization are cogs in a complex system which it is relatively easy to block. The higher the degree to which a country has evolved and the more complex its structure, the more opportunities it offers for subversive action which can be carried out only under the protection and in the atmosphere of acts of violence. As is the case with all higher organisms, the European countries are fragile. Not to take advantage of this weakness would be to renounce recourse to a very effective mode of action; it would be to complicate deliberately the task of destruction which is the objective of all war.

In no country does there exist, normally, national unanimity; a distasteful fact, but a fact nevertheless. The Communist countries are not exempt from this rule. The conditions for a social revolt exist everywhere to a greater or lesser degree, or, at least there are enough seeds in each national soil for revolutionary harvests to be possible.

There is no reason for thinking that this situation would not be taken advantage of during the course of a future war. It seems more in conformity with the doctrine of the Communist aggressor to make use of political and national passions than to unleash a sudden attack of the purely military type. The peoples who resorted to resistance during World War II came to realize that they had a powerful weapon at their disposal. At that time, however, they had not obtained the best results from it since they did not recognize its possibilities and were not prepared for its employment.

We must conclude that in a future war guerrilla action will appear more in its total form than in its purely military form, even in Europe. One can imagine that it will be, perhaps, in Europe that it will assume its most virulent form if, from a synthesis of the experiences gained, there finally is deduced a firmly established doctrine.

The sudden, violent character of nuclear war as we see it today would seem to render the historically slow development of guerrilla war impossible. It appears that the decision is to be obtained in a few days after a frightfully violent exchange of missiles of destructive capacity. But this is an overly simplified idea of what a generalized war could be. Since it would be generalized, it would extend to vast theaters.

We may doubt that for many years yet, the belligerents who possess atomic weapons will have enough of them to saturate all the areas in which the hostilities will occur. In many places classical weapons probably will be used. The conditions of atomic war will be limited to particular zones; contact zones between armies, in-

dustrial zones, and vital points of the transportation zones between the latter two. Furthermore, it is not at all certain that the decision will be obtained rapidly.

Atomic War

If the belligerents decide to wage a nuclear war, it seems logical to believe that they will not engage themselves like duelists, running the risk of lying helpless after the first shot. It is much more likely that they will have planned on the moment when, the greater part of the atomic armament having been used up, it would be necessary to continue the war, if only on the most favorable hypothesis of an exploitation of the results obtained during the first days. In the chaos of the destructions will we not find precisely the ideal conditions for conducting a guerrilla war?

The effects of atomic bombardments will have been still greater in the psychological domain than in the material. In part, the regular armies will have been eliminated. They will have to be compensated for until they can be reconstituted. The disorder of minds will be in keeping with the disorder of the countries.

What better conditions could there be for the rising of local war leaders, inspired with various ideologies, who will continue the fight and regroup themselves to form ensembles with the partisans of one common ideal. They will then turn to the regular units of the regions who have not been, or who have been but little, affected by the atomic projectiles. They will ask them to constitute the nucleus of the new regular forces and, while waiting until they are in a condition to act, will prepare their intervention by occupying the country, by providing the leaders for the population, and by satisfying the most urgent needs of the latter. It may be possible that in their arsenals these guerrilla leaders will find atomic weapons, not very numerous, perhaps, yet capable of producing decisive effects within the local framework.

To be sure, this guerrilla action, even though following the general principles and rules already known, will possess a tempo and a nature far different from the guerrilla actions of the past and the present. It also will belong to the atomic age.

The type of war between two states or two groups of states against one another may be either a war of the most classical character or operations extending over the entire area. One may, therefore, expect guerrilla action to play a very small role. The more the conflict is actually limited and more definitely localized, the less will guerrilla action have a chance to develop.

Between two non-Communist states it seems probable, because of the doctrines existing, that every conflict would follow a classical trend. Between a Communist and a non-Communist state there are, on the contrary, great chances of ideological factors making themselves felt and favoring the outbreak of guerrilla actions, either as the result of spontaneous internal troubles before the entry of the regular armies into action or after the beginning of hostilities. The objective of the conflict would be ideological between two Communist states. It would lead to a generalization of guerrilla actions in their most total form since it would stir up, better even than civil war, a religious quarrel.

It is this same character that would dominate any war limited to the confines of the frontiers of a state or a political organization. Since 1945 practically all wars have belonged to this type except the war in Korea, which the unique circumstances of the geographic form of the theater of operations quickly transformed into a classical war. The various degrees of guerrilla action are to be found in them; generalized terror, clandestine civil administration and military command, the creation of operational bases at first mobile, then fixed, attacks of growing mag-

nitude on the adversary and on his system of communication, the conquest and organization of "liberated" zones, the constitution of regular forces, and the coordination of the latter and guerrilla units. Doubtless one would find all these well-known stages of revolutionary war adapted to the local, social, and physical conditions.

In this second type of limited war, guerrilla action would play the leading role, and counterguerrilla action would have as its objective the containment of the guerrilla action to its lowest stage in order to prevent the development of a larger war.

Cold War

But where is the place of guerrilla action in cold war? Since cold war does not make use of violent means, it seems difficult to assign it one.

It is not realized sufficiently that a guerrilla war requires a very long preparation. Hitler prepared his war. However, he failed in the psychological preparation which might possibly have given him concrete results in certain countries. The causes of this failure were, perhaps, the minimization of the possible effects of guerrilla action, a lack of adaptation of methods and procedures, and overestimation of his purely military power. But the principal cause was that too short a time had intervened between the coming of Nazism to power and the unleashing of the war.

All total guerrilla action requires a patient implantation of a framework formed of political militants inside the country one wishes to "liberate." This framework must constitute a net as closely woven as possible, but in which each element must be able to move on its own initiative in the general direction of the desired movement. Such education requires a long time, for it is an education that must be given to a limited number of leaders, and not simple technical instruction that can be acquired in several months. Furthermore, public opinion must be prepared to receive certain ideas. Public opinion acts quickly, but is altered slowly. What guerrilla action seeks is not a flareup that dies out quickly, but a powerful current which carries far and surely.

It may be said that it took the Vietnam administrators 20 years to create the conditions which rendered the war in Indochina possible. Furthermore, outside and unforeseen developments hastened the beginning and the development of the movement.

Cold war permits achievements which would be impossible in peacetime. The strained state of international relations permits certain actions in a psychological atmosphere which causes them to be accepted as inevitable manifestations of the rivalry and the hostility between the opposed groups of states. Under the cover of clearly defined ideological positions, and in the actual confusion of ideas, it becomes possible to make an effective preparation for guerrilla warfare—indoctrination of minds by skillful propaganda, the constitution of cells of action, and the elaboration of plans.

Legal provisions serve as a cover for maneuvers in the most military sense of the word for general rehearsals of what will be revolutionary disturbances. In spite of the interest or the importance of the immediate objective of labor strikes, collective manifestations, and changes of opinion the aim pursued is more general and more definite at the same time. It is of long-dated maturity and of vast range. The periods of cold war with their moments of relative calm and crises are simultaneously a form of hostility in action and the preparation for other, more trenchant, forms of conflict.

Modern civilization accentuates the specialization of men in given tasks. Civilized man is a man of a single movement, tirelessly repeated during his entire life. On

the contrary, the savage was able almost alone to face up to his elementary needs.

In developed countries, men depend on one another. Social phenomena can no longer be isolated from one another. War, which formerly was an affair of professionals operating in the midst of indifferent or passive populations, has become the business of everyone, and of all the institutions of an organized state. It is a delusion to think that it could again be restricted to a single category of citizens delegated as the Horatii and the Curiatii with the task of defending the country.

Conclusions

Guerrilla war alone is not a particular form of military activity. It is that part of war in which the individual participation of each one is best expressed, and in which the constant interferences of many factors are most manifested. It is in it that the entire population is the most closely joined with war. When it participates in the formation of regular armies, it obeys laws and executes orders given by the supreme political authorities of the country. But when it gives itself over to guerrilla actions it acts largely on its own authority and that of its own leader, even if one concedes the undeniable fact that it is amenable to suggestion and can be directed.

History has proved the fallacy of the numerous assertions of the omnipotence of the popular will, but at the same time has recognized its influence and possibilities when it is organized and when it acts in accordance with plans. It has concluded that this will has been the dynamic element which gave life and strength to previsions which would have been no more than simple staff studies without it.

The present evolution of the world cannot but accentuate these conclusions. If nuclear energy is a fact, human energy is another. Although it is less well-understood and less easily controlled than the first, it is nonetheless existent. The different forms of guerrilla actions are different utilizations of this energy of men.

They have their place in war. While one could believe that they were formerly only accidental, it is the reverse that will be true in the future. Wars without guerrilla operations will be the exception because future conflicts will exceed the bounds of diplomatic politics and military technique.

The place of guerrilla action in war is a choice place. Its rise to such a place, together with the atomic fact, dominates the transformation of war in the present era.

I don't expect that we shall ever come to the stage when we can say that there is nothing more that can be done to assure the complete ability of this country to defend itself against any possible type of warfare. Warfare concepts keep changing as new ideas and developments come into being. For this reason we can never remain static. We must keep changing, and keep moving forward with the times.

Major General William M. Creasy

BOOKS OF INTEREST TO THE MILITARY READER

TIN CAN ON A SHINGLE. The Full Story of the *Monitor* and the *Merrimac*. By William Chapman White and Ruth White. 176 Pages. E. P. Dutton & Co., Inc., New York. $3.50.

BY LT COL HAROLD E. BEATY, *CE*

The names of the fighting ships *Monitor* and *Merrimac* stand clear in every American's mind, yet the facts behind these two war vessels have been rather obscure. The Civil War Between the States was essentially fought on land with an effective blockade of the Southern ports by the North. To challenge this blockade the South hastily constructed an ironclad fighting ship, the *Merrimac*. Upon learning of this new "secret weapon" under construction, the North rushed to completion the *USS Ironclad Monitor* in 152 frantic days.

When the *Monitor* appeared in Hampton Roads to challenge the *Merrimac*, the spectators were startled to see its unconventional design. The steam-driven ship was mostly submerged except for its flat deck and a single gun turret mounted amidship, thus giving it the appearance of "a tin can on a shingle."

Strange as it may seem, on 9 March 1862 a sea battle was fought just off Norfolk, Virginia, between the *Monitor* and the *Merrimac*, in which neither was victor. Yet this battle made the navies of the world obsolete. The ironclad ships had proved themselves on that day; arguments persist today as to the victor.

Recorded is the full story of that famed sea battle, of the crews that manned both ships, of the architects and builders, and of the events which preceded and followed the brief conflict.

This unique and interesting book is well-written, presents all the fundamentals with historical accuracy in simple terms, and is a worthy contribution to the history of the American Navy.

GUIDED WEAPONS. By Eric Burgess. 255 Pages. The Macmillan Co., New York. $5.00.

BY LT COL ROBERT M. WALKER, *Arty*

This meticulously annotated volume classifies guided weapons according to their usage, and discusses each type in separate chapters. It presents detailed information on missiles now in being and planned for the future, including technical features such as guidance systems, powerplants, propellants, and lethal effectiveness.

Besides offering descriptions of current guided weapons and the system under which they are evolved, the author masterfully interweaves the dramatic story of the development of guided missiles from the time they were first brought into military use. The dilemma of maintaining a balanced economy while creating a national defense based on missiles also is discussed with a keen insight into the problem involved.

This work by an acknowledged expert in the field of which he writes will prove a valuable reference source. Both layman and missile expert will find it a rewarding experience and an exciting adventure.

FRATERNITE D'ARMES FRANCO-AMERICAINE (Franco-American Brotherhood in Arms). Special De Luxe French and English Editions of the French "Revue Historique de l'Armée," c/o Miss B. C. Pousseur, 1759 R Street N. W., Washington, D. C. $2.50 (regular copies), $8.00 (numbered copies).

BY LT COL JEAN P. MESLET, *French Army*

This special issue published on the occasion of the 200th anniversary of the birthday of La Fayette is dedicated to the Franco-American Brotherhood in Arms throughout history.

The foreword consists of letters signed by Presidents Eisenhower and Coty which stress the value of the work for Franco-American relations.

The first part covers the War of Independence, La Fayette, Rochambeau, de Fleury, and Lieutenant General Comte d'Estaing "whose presence on the coasts has so greatly aided the US cause." It also includes such illustrated considerations as the French influence on early uniforms in the United States.

Part two is devoted to World War I and more specifically to the US Second Division at Blancmont and to the Marines at Belleau Wood. A beautiful tribute is rendered to all Americans who, with ardent faith, came to France to help and defend her when she was in peril.

Some of the highlights of the Franco-American Brotherhood in World War II are covered, and the volume ends with three interesting articles on the French battalion in Korea, West Point, and the French "Ecole Polytechnique," and the American assistance to France (1939-57).

The readers will be impressed by the historical accuracy of the study, the number and quality of the illustrations, and by the highly artistic format.

This book constitutes a valuable compilation in a single work of numerous topics and references for multiple purposes.

HOW THE MERRIMAC WON. By R. W. Daly. 211 Pages. Thomas Y. Crowell Co., New York. $4.00.

BY LT COL IRVING HEYMONT, *Inf*

The title of this book certainly is the most provocative and outwardly misleading of any publication dealing with the Civil War. Professor Daly, an instructor at the United States Naval Academy, is relatively unconcerned with the actual battle between the *Merrimac* and the *Monitor*. His interest is in exploring the strategic objectives of the two ships.

After careful examination and assessment of all the multiple factors involved, he concludes that the *Merrimac-Monitor* fight was essentially the drama of a man against a ship—McClellan versus the *Merrimac*.

The *Merrimac*, according to the author, was the true strategic victor, despite its short life, because it denied the use of the James River to McClellan. As a result, McClellan's plan for a quick end to the Civil War in 1862 by capture of Richmond by a sweeping invasion by the James River was foiled. Denied the free use of the James by the threat of the *Merrimac*, McClellan's snail's pace foot slogging march up the peninsula led to his defeat by Lee and Johnston and the prolongation of the war for three more years. In that sense, Professor Daly maintains, the *Merrimac* was the true strategic victor.

His contention is advanced in a convincing manner and an easy reading style. Whether the reader agrees, this book is a fascinating reappraisal of one facet of the Civil War.

THE GENTLEMAN AND THE TIGER. The Autobiography of George B. McClellan, Jr. Edited by Harold C. Syrett. 375 Pages. J. B. Lippincott Co., Philadelphia, Pa. $6.00.

EXPLORATIONS IN AWARENESS. By J. Samuel Bois. 212 Pages. Harper & Bros., New York. $2.75.

NIGHTMARE OF THE INNOCENTS. By Otto Larsen. 240 Pages. The Philosophical Library, Inc., New York. $6.00.

BY LT COL HOWARD L. FELCHLIN, *Inf*

Today in the Soviet Union millions of helpless, innocent individuals wage an unremitting struggle to live a tormented, terrifying existence in extremely primitive slave labor camps. What is life like in these wretched camps? Why are people sent there and how are they treated by the Soviet authorities? In graphic detail, Mr. Larsen answers these and many similar questions based on the eight years he spent as a political prisoner of the Russians in their slave labor camps.

In recent years there have been a number of books written on this subject but none possess a greater degree of authenticity and stark reality than Mr. Larsen's illuminating narrative.

Having worked loyally for the Communist cause in Norway during World War II, Larsen hardly expected to be imprisoned by the Soviets when he returned to Russia, of his own volition, in 1945. He was sentenced to 10 years of hard labor for the alleged offense of espionage against the Soviet Union. Such is the nature of Soviet justice which is all the more illustrated by the case of three female prisoners sentenced to 15 years of hard labor each for stealing just six pounds of peas.

This is no story of physical brutality in the sense of bestial secret policemen engaged in a sadistic orgy of fortune but an eloquent testimonial to the fantastic inhumanity of the Russian penal system.

A better understanding of the motivating force behind the Soviet system can be obtained by reading this engrossing personal account of hardship, courage, and fortitude. Mr. Larsen has sent an unwritten message on the inner workings of the fear-ridden Soviet mind that should help in evaluating the true nature of Soviet attitude toward the West.

RADIATION: WHAT IT IS AND HOW IT AFFECTS YOU. By Jack Schubert and Ralph E. Lapp. 314 Pages. The Viking Press, New York. $3.95.

BY MAJ CHARLES L. STEEL, JR., *CE*

Radiation has become the most talked of and most controversial subject of this century. Yet to the average person it still is a relatively unknown and mysterious hazard to our present and future life. Even our foremost scientists do not agree as to the possible biological and genetic effects of this new lethal agent.

Doctors Schubert and Lapp have collected together in this book a multitude of facts pertaining to all aspects of radiation, both in peace and war. Technical details are presented so they can be understood by the average American. The story of radiation is unfolded from its discovery in 1895, through the early years of its use when, by misuse and overuse, thousands of persons were subjected to doses which resulted in permanent injury or death, up to the present when radiation has been and is being unleashed in awesome quantities in the form of "fallout" resulting from nuclear explosions.

This book is invaluable as an unclassified reference on the general subject of radiation. Military readers will be particularly interested in the chapters which explain the basic nature of radiation and the sources and probable hazards, as well as those covering fallout from bomb tests and the new nature of war.

The reader is forewarned that, although the authors are outstanding scientists in this field, some of the material presented, especially in the areas concerning worldwide contamination and effects of strontium, may not prove in the future to be a realistic appraisal. So many gaps now exist in our knowledge and interpretations vary so widely that we may find these dangers not nearly so great as suggested by the authors.

and references for multiple purposes.

New York. $2.75.

THE QUARTERMASTER CORPS: OPERATIONS IN THE WAR AGAINST JAPAN. U. S. Army in World War II. By Alvin P. Stauffer. 358 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. $4.00.

BY LT COL RODGER R. BANKSON, *Inf*

The efforts of the Quartermaster Corps to provide the necessities of life to the American forces in the war against Japan are graphically and accurately portrayed in this volume. Starting with the vigorous efforts made by the Quartermaster in the Philippines in 1941, the author gives particular attention to the importance of Hawaii, New Zealand, and Australia as the only large land masses that were developed sufficiently to serve as major bases.

He discusses the problems of logistical support of combat operations under the difficult conditions of distance and climate imposed by the vast spread of Pacific operations, and concludes with a discussion of the continuing problems brought about by the final victory.

Like all books in this monumental series, this volume is meticulously indexed and carefully footnoted. It undoubtedly will prove invaluable in the planning of logistical support of future field operations.

ROADS, RAILS, & WATERWAYS. The Army Engineers and Early Transportation. By Forest G. Hill. 248 Pages. The University of Oklahoma Press, Norman, Okla. $4.00.

BY MAJ ROBERT H. ALLAN, JR., *CE*

The United States Military Academy at West Point, a part of the Engineer Department from its founding in 1802 until the Civil War, was until 1824 the only school of engineering in the Nation. As Mr. Hill so ably points out, this sole source of engineering talent, coupled with the responsibility of the Corps of Engineers for the development of transportation means to open the West, gave the Army Engineers a prominent role in the growth of this Nation.

His book tells the story of how both the Government and private promoters of useful improvements were compelled to demand of the War Department the services of its skilled engineers—the only ones available in our young society. His story tells how the Army Engineers answered this call not only as engineers but as topographers, explorers, professors in civilian universities, and as executives in many of the major civilian enterprises.

Numerous footnotes make for slow but more interesting reading. The volume is well-documented and recommended for American historians and engineers as well as for those who are interested in the dynamic growth story of the North American Continent.

THE UNITED STATES COAST GUARD IN WORLD WAR II. By Malcolm F. Willoughby. 347 Pages. United States Naval Institute, Annapolis, Md. $6.00.

BY MAJ JOHN J. EARLEY, *Inf*

This is a history of the US Coast Guard's participation in World War II, but not a history of the war itself. It chronicles Coast Guard activities in every amphibious operation of the war, from the Greenland patrol before the war started to the transportation of the occupation troops to Japan. Its style is that of a brisk narrative, and it presents the important contribution made by the Coast Guard to the ultimate victory. How the Coast Guard successfully met its great responsibility of preserving the integrity to our ports and coasts against the threats of attack, sabotage, and carelessness makes an especially interesting story.

This account of a little recognized phase of the US war effort is beautifully illustrated, and presents a carefully indexed compilation of source and background material in an easy to read form.

THE TRANSFER OF POWER IN INDIA. By V. P. Menon. 543 Pages. Princeton University Press, Princeton, N. J. $8.50.

BY COL J. C. WINCHESTER, *British Army*

This is an authoritative and detailed account of the events that led up to the transfer of power from Britain to the new sovereign nations of India and Pakistan in 1947.

The author, who was an experienced government official in a key appointment at the time, has described the intricate constitutional problems confronting the British and Indian political leaders and the steps taken to solve them.

Although not of direct interest to military students, it is a well-documented history of a most important period in the evolution of India and Pakistan.

BRITTLE BEHAVIOR OF ENGINEERING STRUCTURES. By Earl R. Parker. 323 Pages. John Wiley & Sons, Inc., New York. $6.00.

BY LT COL MITCHEL GOLDENTHAL, *CE*

The failure of steel plate structures due to the brittle behavior of steel has long been a serious problem. Such failures involving bridges, penstocks, storage tanks, pipelines, and ships reached a peak during World War II, when welded steel merchant ships suffered many casualties.

The National Academy of Sciences—National Research Council prepared this technical textbook which contains a sparkling discussion of the theories and mechanism of structural failure; a review of test methods to evaluate brittleness; interpretations and summaries of test results; a thorough discussion of the effects of welding variations; and a report of service failures.

It is clearly written, profusely illustrated and referenced, and of real interest to the military reader who wants to learn where we stand in the field of brittle-fracture prevention.

THE SOVIET SECRET POLICE. Edited by Simon Wolin and Robert M. Slusser. 408 Pages. Frederick A. Praeger, Inc., New York. $8.00.

BY LT COL HOWARD L. FELCHLIN, *Inf* AND MAJ CHARLES G. FITZGERALD, *SigC*

It is a rare but welcome occasion when a comprehensive, informative, and accurate study, such as this book on the Soviet internal security organs, is made available to the reading public. The book is a noteworthy documentation of the Soviet secret police and security systems. Written in the form of a series of essays, it establishes the irrefutable fact that the Soviet secret police system was born in the earliest days of the Soviet regime, was and still is being developed and expanded by the Communist Party, and will always be the "handmaiden of Communist rule."

Of particular interest is the identity and qualifications of the authors of this collection of essays. They are former Soviet citizens who have had considerable personal experience either as members or victims of various Soviet security organizations. The reviewers are personally acquainted with two of the contributors and accept their major theses as objective, factual analyses of the Soviet internal security system. Personal observations during our three years of travel in the USSR confirm their judgment on the efficiency and thoroughness of the Soviet security organs. The book does contain minor inconsistencies in nomenclature and organizational matters, but they do not detract from the excellence of this valuable detailed study.

This book corroborates the fact that Communist leadership cannot hold power without the brute force of the Soviet security organs. It will help to eliminate confused thinking on this subject and to increase public understanding of the forlorn lot of the Soviet citizen caught in the iron vise of the interlocking Communist Party and Soviet police systems.

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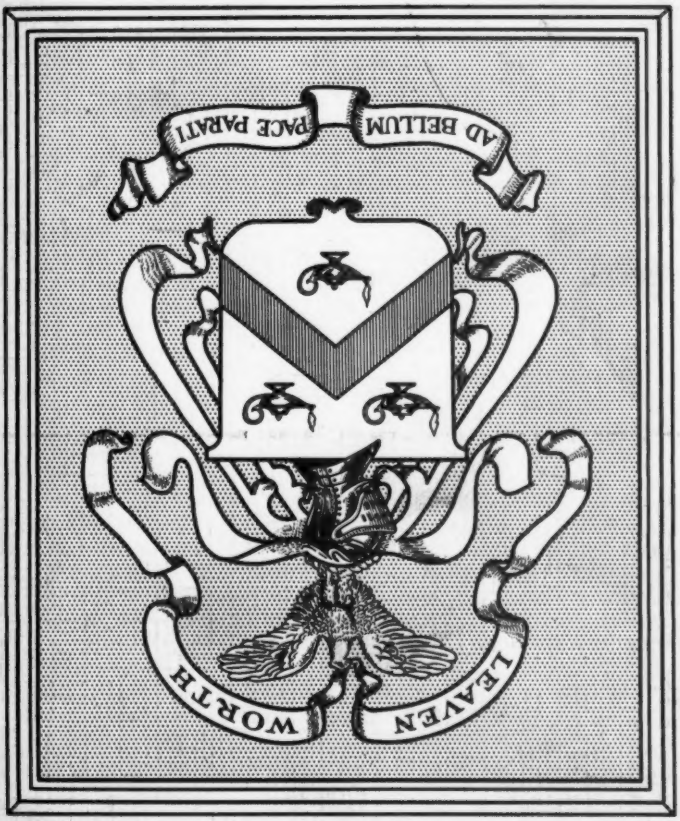
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